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ABSTRACT

A follow-up study of 1983/1984 graduates of Chapter 74 vocational education programs had two primary components. The graduate survey examined employment and education progress of vocational students at a point well after graduation. It measured graduates' labor force and wage status, employment stability and wage growth, and perceptions of training received. Over 1,200 graduates were interviewed by telephone. A mail survey of 440 employers who directly supervise vocational education graduates measured overall satisfaction with vocational graduates, measured employers' perception of graduates' academic and technical preparation, and compared graduates' and employers' perceptions along some related dimensions. Results indicated Massachusetts vocational high schools are highly successful in preparing their students for the labor force. The majority made a successful transition to the job market and earn competitive wages. Approximately 1 in 10 graduates was enrolled in a postsecondary program. Overall, both employers and graduates expressed positive opinions about vocational education. Findings suggested these issues of concern to vocational education administrators and policymakers: the comparative wage disadvantage of female graduates in the labor market, less positive ratings of academic preparation than of technical training by employers and students, and some discrepancy between employers' and graduates' perceptions of work habits and work quality. (Appendixes include a technical analysis of wage variation, sample selection and data collection methodology, and instruments.) (YLB)

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CHAPTER 74 VOCATIONAL EDUCATION PROGRAMS IN MASSACHUSETTS: RESULTS FROM A SURVEY OF 1983/84 GRADUATES AND THEIR EMPLOYERS

31 March 1987

Final Report

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Finally, we would like to thank a number of our colleagues at Abt Associates for their various contributions to this research project. We gratefully acknowledge the contributions of the following individuals: Dr. Howard Bloom, who assisted in the design of our sampling plan; Dr. Joseph Frees, who contributed to the design of the survey instruments; Ms. JoAnn Jastrzab, who directed the project in its initial phases; Ms. Annette Butler, who provided administrative support throughout the contract; Mr. Tom Martin, who managed the project data files, and Ms. Diane Porcari and her team of interviewers, who conducted the interviews with the graduates. Final responsibility for the analysis and conclusions presented in this report is the authors' alone.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY.. i

CHAPTER 1 INTRODUCTION TO THE STUDY.................................. 1

CHAPTER 2 CHARACTERISTICS OF THE SURVEY RESPONDENTS................ 4

What are the personal characteristics of the respondent population?.................................... 4

What are the programmatic characteristics of the respondent population?.................................... 5

What are the geographic characteristics of the respondents?... 9

CHAPTER 3 CURRENT LABOR FORCE STATUS OF VOCATIONAL EDUCATION GRADUATES.. 19

What were the graduates doing at the time of the survey?.. 19

How much are vocational education graduates being paid in their current jobs?.................................... 21

Do wages appear to vary according to the sex or race of the graduate?..................................... 24

Are the jobs currently held by graduates related to their vocational education training?................... 25

Do training related jobs pay better than other full-time jobs?... 26

Are current postsecondary school programs related to vocational programs studied at the secondary level?...... 27

CHAPTER 4 EMPLOYMENT STABILITY AND WAGE GROWTH...................... 38

What was the labor force status of the respondents one year prior to the survey (Fall 1985)? How does this compare to their status at the time of the survey?....... 38

How much employment stability is there among vocational education graduates?................................. 41

How much wage growth has been experienced by full-time workers over the year prior to the interview?........... 43

Are workers able to move out of low-wage jobs over time?... 45

Does overall employment stability appear to be associated with improved wage status?............................ 47

TABLE OF CONTENTS
(Continued)

Page

CHAPTER 5 VOCATIONAL EDUCATION AND WORK QUALITY: GRADUATES' PERCEPTIONS.......... 55

How did graduates rate the quality of the academic and technical components of their vocational education?..... 55

How did the graduates rate vocational shop instructors and job preparation/placement efforts?.......... 58

What rating did graduates give themselves on their current jobs?.......... 61

Do the graduates' perceptions of vocational education program components (academic and technical) and current job performance vary according to personal and programmatic characteristics?.......... 62

What is the relationship between student evaluations of vocational education programs and their subsequent self-evaluation of performance on the job?.......... 66

CHAPTER 6 EMPLOYERS' ASSESSMENT OF THE GRADUATES.......... 77

What type of graduates allowed us to contact their supervisors? Was there any bias in the sample of employers contacted?.......... 77

How did employers rate vocational graduates on the job?.......... 79

How did the employers rate the graduates' academic education?.......... 82

How do the employer evaluations vary by the graduates' personal characteristics or program studied?.......... 84

Did employers report that the graduates are in training related jobs?.......... 86

APPENDIX I TECHNICAL ANALYSIS OF WAGE VARIATION.......... 97

APPENDIX II SAMPLE SELECTION AND DATA COLLECTION METHODOLOGY.......... 102

APPENDIX III GRADUATE SURVEY INSTRUMENT.......... 114

APPENDIX IV EMPLOYER SURVEY INSTRUMENT.......... 122

CHAPTER 74 VOCATIONAL EDUCATION PROGRAMS IN MASSACHUSETTS: RESULTS FROM A SURVEY OF 1983/84 GRADUATES AND THEIR EMPLOYERS

EXECUTIVE SUMMARY

In the Spring of 1986, the Massachusetts Department of Education, Division of Occupational Education contracted with Abt Associates Inc. of Cambridge, Massachusetts to conduct a follow-up study of 1983 and 1984 graduates of Chapter 74 vocational education programs.

The study had two primary components with distinct yet interrelated objectives. The first component was a survey of graduates for the purpose of examining employment and education progress of vocational students at a point well after graduation. More specifically, this survey measured the graduates' labor force and wage status at the time of the survey (fall, 1986), employment stability and wage growth over a one-year period prior to the survey, and perceptions of the technical and academic training received through the vocational education system. Over 1,200 graduates from a representative sample of the two classes were interviewed by telephone to gather this follow-up information.

The second component was a survey of employers who directly supervise vocational education graduates. The objectives of this component were to measure overall levels of satisfaction with vocational graduates; measure the employers' perception of academic and technical preparation received by graduates; and compare graduates' perceptions and employers' perceptions along a number of related dimensions. Approximately 70 percent of those graduates who were employed provided consent to contact their supervisor. A total of 440 employers completed and returned the mail survey.

Prior to reviewing the survey findings, it is important to summarize the characteristics of the graduates on whom data were gathered. From a demographic perspective the respondents tended towards homogeneity, with the single largest group being white males between the ages of 20 and 21. The vast majority were still living within 50 miles of home. Only one in four of the respondents was female, while only 6 percent of the total respondent population was nonwhite.[1]

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[1] According to the Department of Education, approximately 20 percent of vocational education enrollees are special needs students. Although this characteristic was not isolated during the survey, it should be borne in mind as the findings are reviewed.

From a programmatic perspective, however, the respondents were quite diverse, graduating from nearly seventy different high schools in approximately 50 separate occupational areas of study. In spite of this variation, it is important to note that there was considerable clustering of males and females both within and across occupational areas. Men, for the most part, opted for traditional "blue collar" occupations such as building trades, automobile/engine related, machine and metal trades, and electrical. Women, on the other hand, tended to cluster in a quite distinct set of occupations including design, health, vocational home economics, business/office, and marketing and distributive education fields.[1] This voluntary clustering by sex is an important issue to consider as employment and wage findings are reviewed across the various occupations. This clustering is illustrated in Exhibit 1, which shows the percentage of males and females graduating in each field.

One noteworthy exception to this tendency was in technical occupations, which included data processing, electronics, and computer-related disciplines. Graduates in these fields represented approximately 12 percent of the respondents and were quite evenly divided between males and females.

Overall, the results from both the graduate and employer surveys are very positive. Over three out of four respondents reported that they were working full-time at the point of the follow-up survey. Of those who were not working full-time, the vast majority were either full- or part-time students, a portion of whom were employed part-time. That nearly one in ten (one in five from technical programs) were full-time students last fall, both in training related and other more academic programs, is a positive reflection on the vocational system's ability to provide its students with options and flexibility in career paths.

Unemployment was not a problem among this population, with only 3.6 percent reporting that they were not working and actively seeking a job. This positive labor force profile was exhibited both in the metro-Boston area (which has experienced exceptional employment opportunities) as well as in the balance of Massachusetts, where overall levels of unemployment have been somewhat higher. This suggests that the positive performance of graduates

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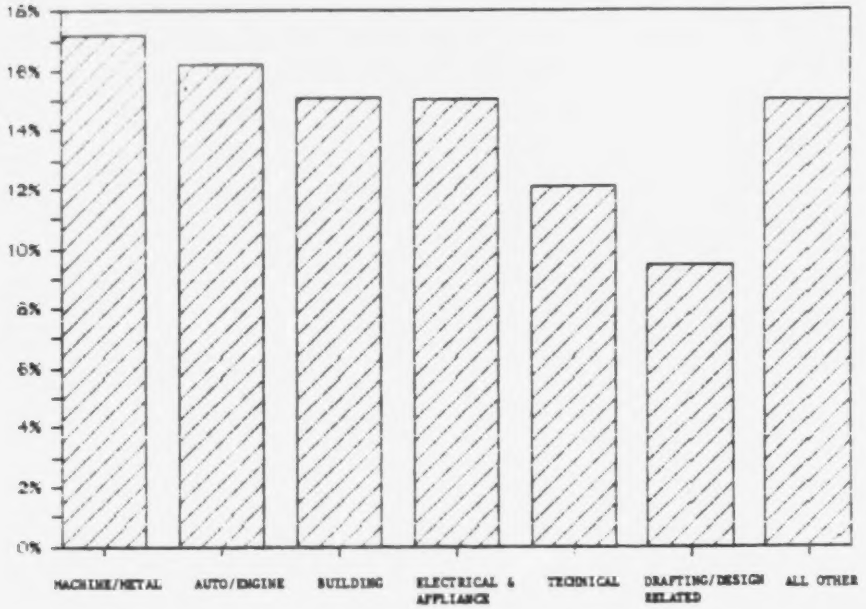
[1] In the main body of the report vocational home economics is referred to as "consumer and homemaking." It should also be noted that business/office programs are not state-approved Chapter 74 programs but are nonetheless offered in a few vocational/technical school districts.

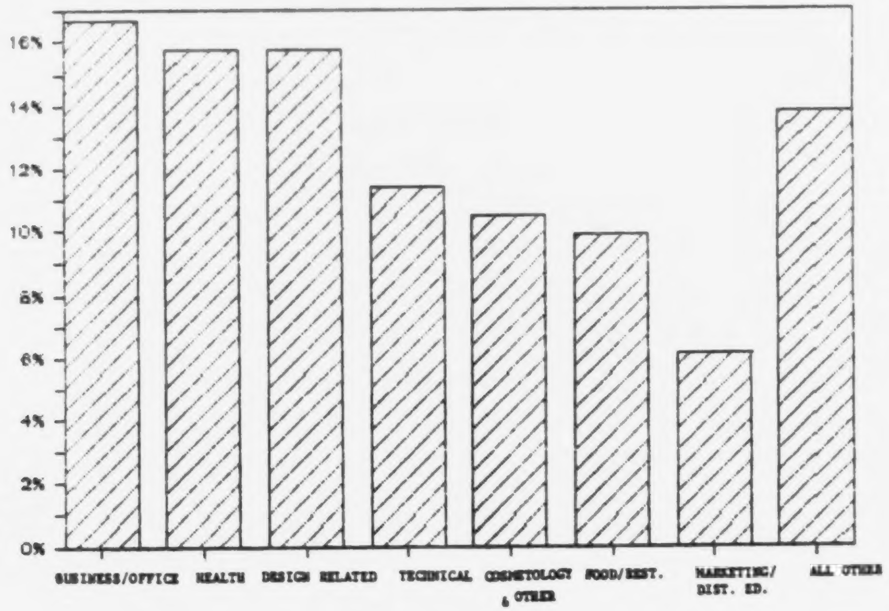
Exhibit 1

Occupational Fields Studied by Male and Female Graduates

MALES



FEMALES



during this period was more than simply a reflection of the employment opportunities created by a strong overall economy.

On average, full-time workers were earning in excess of $8.00 per hour, although this wage rate varied considerably by both gender and program of study. The difference in earnings between males and females was striking. Half of all male workers were earning more than $8.00 per hour at the time of the survey. Fewer than one in six females were earning at this level. Conversely, 41 percent of all full-time female workers earned $6.00 per hour or less compared to only 13 percent of all male workers.

Gender variation in wages appears to be strongly related to the difference in programs of study chosen by males and females. The traditional "blue collar" programs which were heavily dominated by men (i.e. automobile/ engine, machine and metal, building trades, etc.) all generated hourly wages above $8.60 per hour on average. In contrast, those occupational fields which attracted large concentrations of females reported hourly wage rates ranging from $5.90 to $7.00 per hour.

The data from the survey also indicated that workers who were employed in training related positions on average reported wages higher than those of other graduates. This was primarily true in higher-wage occupations where there appears to be a strong incentive to pursue the field in which vocational training was received. The positive employment and wage experiences reported by graduates in traditional "blue collar" occupations may be somewhat counter-intuitive in an economy that has been so heavily characterized by growth in the service sector. However, it appears that vocational preparation is providing the credentials required for individuals to make a strong showing in economic sectors experiencing only moderate growth.

In addition to a "snapshot" of a single point in time, the survey also provided an employment and wage profile over the one-year period immediately preceeding the follow-up survey. Again we observed a positive trend towards stable employment and improving wage status. The vast majority (90 percent) of those who were employed one year prior to the survey were still employed at the point of follow-up. Many who were in school or working part-time had made the successful transition to full-time employment by the time of the survey.

Employment-related performance measures (e.g. duration on current job, total number of jobs held since graduation) suggested a high degree of job stability among graduates as a whole. This was particularly true among those who had prepared for traditional "blue collar" occupations. It is likely that the comparatively high wage potential in these fields serves to minimize the rate of job turnover.

Comparatively lower rates of job tenure were reported by graduates of business/office, vocational home economics, and food and restaurant programs.[1] It should be stressed that instability of employment should not necessarily be interpreted negatively. For students who have prepared for comparatively low wage occupations, it may be a rational economic decision to change jobs frequently in pursuit of better wages. We should also stress that it is not uncommon for high school graduates to "try-out" various employment opportunities before settling into a position with a longer-term horizon.

Over this same one-year time span, graduates also reported considerable wage growth. Nearly half of the survey respondents experienced wage increases in excess of 20 percent. Females participated in this general upward movement; however, comparatively few experienced the large gains noted above. Although there was significant overall improvement in wage conditions, there remained a core 16 to 18 percent of the employed population who continued to earn comparatively low wages (less than $6.00) over the entire year. Nearly 40 percent of all female graduates were in this category compared to only 10 percent of the males.

The final portions of the survey focused primarily on perceptions of vocational education and work quality as expressed by both graduates themselves and by their direct supervisors. Of particular importance was the quality of technical and academic preparation received, as well as perceived performance on the job.

As illustrated in Exhibit 2, the survey results indicated that technical and math preparation was, on average, rated quite highly by vocational education graduates. Specifically, 88 percent of the respondents rated their technical training as either 'excellent' or 'good.' Similarly, four out of five gave their math education such a favorable rating. Other academic subjects on the other hand were not perceived quite as favorably. Slightly over 70 percent of the graduates rated reading preparation as 'excellent' or 'good,' while less than 70 percent gave this rating for writing and science. One out of every three respondents rated their education in verbal skills as 'fair' or 'poor.'

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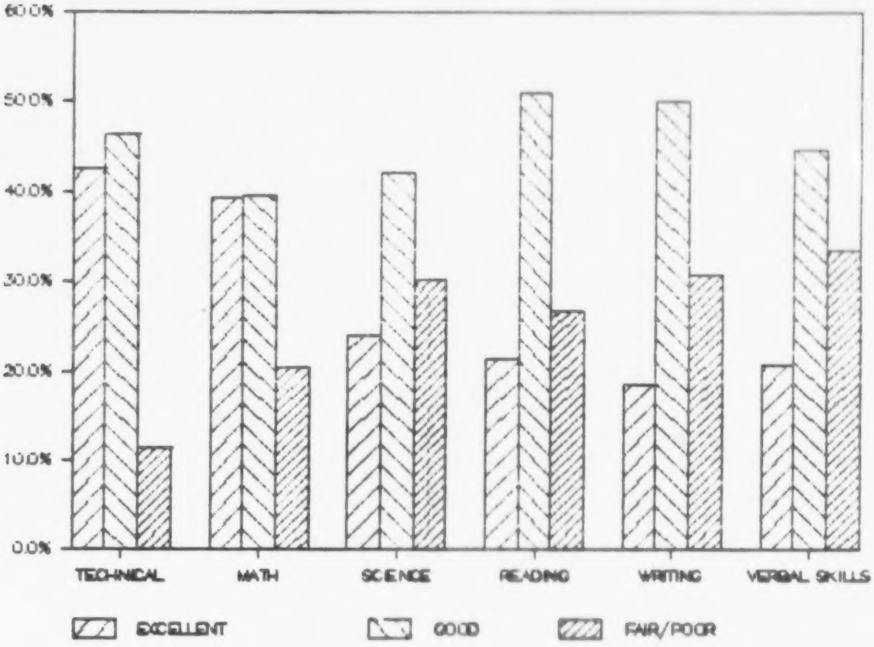
[1] See footnote page ii.

Exhibit 2

Graduates' Evaluation of Educational Components



Employers also rated the technical capabilities of the students quite highly, although not as positively as the students themselves did. Approximately three out of four employers reported that they were quite satisfied with the graduates' technical skills. Interestingly, however, employers were likely to rate graduates' academic preparation higher than the graduates rated their own academic preparation. Thus despite the dissatisfaction of a small proportion of graduates with the quality of their education in reading and verbal expression (between one quarter and one third), most of their current employers felt that vocational programs were generally successful in this area. Part of the discrepancy may result from a difference in perspective. It can be conjectured that employers are likely to be basing their judgements strictly on the graduates' ability to perform on the current job. In contrast, the graduate may be looking ahead and expressing concern that his/her academic skills may not be adequate to move up, beyond this current job.

Several additional points should be noted about these perceptions of vocational preparation. Female graduates generally rated both academic and technical offerings more positively than their male counterparts. Similarly, employers rated females higher than males with respect to both technical skills and academic preparation. This is particularly noteworthy in light of the considerable wage disadvantage experienced in the labor market by female graduates. Regional vocational/technical graduates also gave the highest ratings to both academic and technical training. Comprehensive high schools received the lowest ratings for technical training.

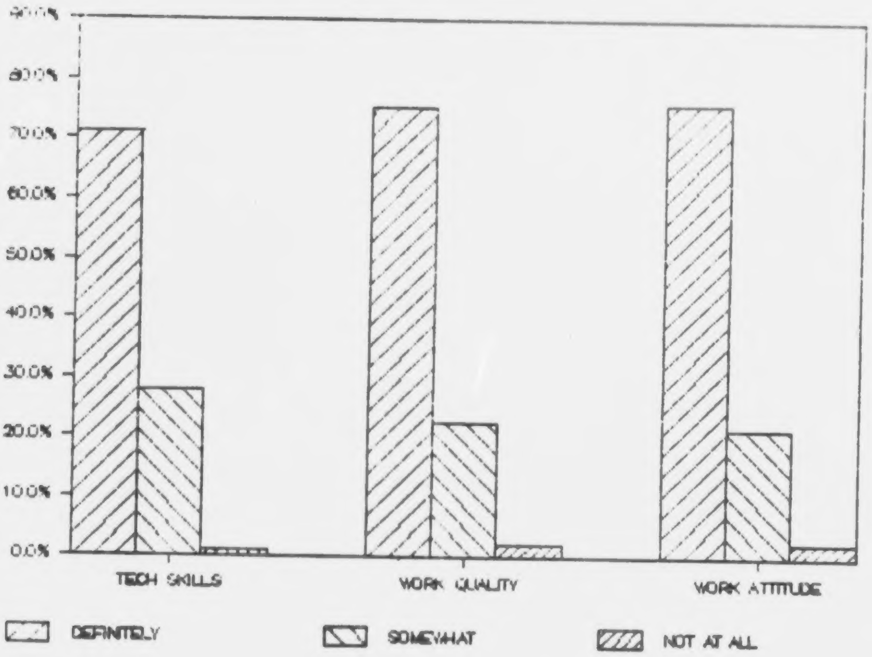
In addition to technical and academic preparation, the graduate and employer surveys also captured perceptions of job performance along such dimensions as work quality, compatibility with co-workers, and work habits. For the most part, graduates exhibited a great deal of self-confidence in these matters. Over nine out of ten of the respondents believed that their boss was 'definitely' satisfied with their work quality. Virtually all of the respondents reported having good work habits and getting along well with their co-workers. Although employer responses along similar dimensions were generally positive, there were some differences of opinion. Most noteworthy was the rating of work habits where nearly 90 percent of the former students felt they 'definitely' had good work habits compared to only 67 percent of employers. A similar discrepancy between graduates' and employers' perceptions was also noted with respect to work quality. These findings are of some concern since employers of young entry-level workers often tend to value solid work habits more than technical skills themselves. Exhibit 3 illustrates the employers' satisfaction with various components of the graduates' on-the-job performance.

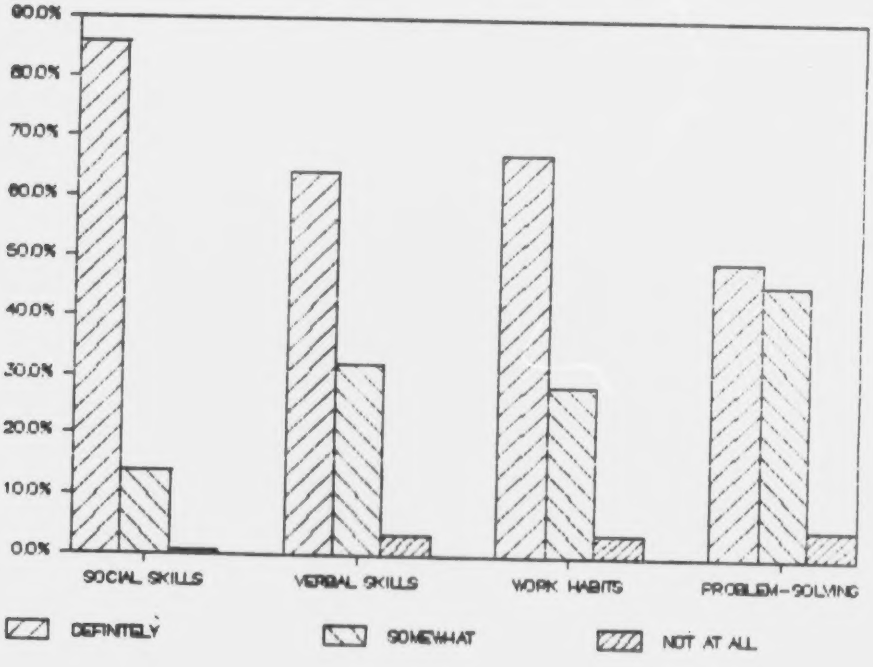
In spite of the differences in perceptions noted above, employers still felt quite strongly that vocational education graduates were better prepared to perform their job than non-vocationally educated co-workers. Nearly half of the employers surveyed expressed this opinion. Only 5 percent of the employers believed non-vocationally educated workers to be superior.

In conclusion, the findings of this survey of vocational graduates and their employers indicate that Massachusetts' vocational high schools are highly successful in preparing their students for the labor force. With a solid technical background, the majority of graduates were able to make a successful transition to the job market, and earn competitive wages. Additionally, approximately one in ten graduates were enrolled in post-secondary programs at the time of the survey. Overall, both employers and graduates expressed positive opinions about vocational education. The survey

Exhibit 3

How Satisfied Were Employers With Various Aspects of Graduates' On-the-Job Performance?





findings also suggested several issues which will likely be of concern to vocational education administrators and policymakers. First is the comparative wage disadvantage of female graduates in the labor market. This appears to be highly related to the process by which students self-select into various occupational fields of study. Second, although overall ratings are quite high, both employer and graduate respondents tended to rate academic preparation less positively than their technical training. Finally, the data indicate that there is some discrepancy between the employers' and graduates' perceptions of work habits and work quality, two components which may play as large a role in the graduates' success in the labor market as actual technical skill.

CHAPTER 1

INTRODUCTION TO THE STUDY

The Massachusetts Department of Education, Division of Occupational Education, has demonstrated a strong commitment to evaluation research through an ongoing program of select follow-up studies. These have been conducted on various subgroups of former vocational education students including community college day-program completers and post-secondary school completers. In the Spring of 1986, the Department contracted with Abt Associates Inc. of Cambridge, Massachusetts to conduct another follow-up study in this ongoing series.

The focus of this effort was 1983 and 1984 graduates of Chapter 74 (secondary) vocational education programs. The study had two primary components with distinct objectives. The first component was a survey of graduates for the purpose of examining employment and educational progress of vocational students at a point well after graduation. More specifically, this survey measured:

- labor force and wage status at the time of the survey (Fall 1986);
- employment stability and wage growth over a one-year period; and
- graduates' perceptions of the technical and academic training received through the vocational education system.

The second component was a survey of employers who directly supervise vocational education graduates. The objectives of this evaluation were to:

- measure overall levels of satisfaction with vocational graduates;
- measure the perception of academic and technical preparation received by graduates; and
- compare graduates' perceptions and employers' perceptions along a number of related dimensions.

A sample of approximately 2,000 graduates was randomly selected from the classes of 1983 and 1984. These former students represented all 43 selective vocational schools, all 16 comprehensive schools with five or more vocational offerings, and 9 comprehensive schools with fewer than five programs. A telephone survey of these graduates was conducted in November, 1986 using contact information provided by the individual schools.

Employers were contacted only when the student provided direct permission during the interview. Approximately 70 percent of those employed (700 graduates) provided consent and questionnaires were mailed to their supervisors. Approximately 440 completed and returned the survey, resulting in a response rate of 64 percent. Appendix II of this document provides a detailed discussion of the survey methodology and data collection activities for both the graduate and employer surveys.

The overall design of the project was monitored by an Advisory Committee set up expressly for this purpose. Representing the Department of Education, high school administration, vocational guidance counselors, and bilingual vocational education, as well as the students themselves, the Advisory Committee was established to bring an "insider's" perspective to the research design and implementation. Committee members provided valuable insight on issues of student response, methodology, and analytical questions of concern to vocational administrators. Of particular importance was their input in the design of the survey instruments and the analysis plan.

The report which follows is divided into six chapters following this brief introduction. Chapter 2 describes the respondent population and provides a summary of personal, programmatic and geographic characteristics. Chapter 3 reviews the current labor force and wage status of all survey respondents. In Chapter 4, we concentrate exclusively on the population who were employed, focusing in particular on their employment stability and wage growth over the one-year period prior to the follow-up survey. Chapter 5 is devoted to the graduates' perceptions of their vocational education, including their assessment of technical and academic preparation as well as a self-assessment of their current job performance. Finally, Chapter 6 reviews the employers' perceptions of individual vocationally educated employees. Similar to the graduate survey, the employers were asked to rate the academic and technical education received by these graduates. This chapter also correlates the employer and student assessments along various related dimensions.

Each chapter is organized around a series of research questions. Each research question is followed by a parenthetical reference to the corresponding data tables which can be found at the end of each chapter and contain detailed data supporting the discussion. For the convenience of the reader, key points from these tables have been extracted and interspersed throughout the text in the form of graphs, charts or small exhibits. Additionally, comments solicited from both graduates and employers have been included throughout the report to illustrate on a more subjective level the empirical findings of the research.

CHAPTER 2

CHARACTERISTICS OF THE SURVEY RESPONDENTS

Prior to reviewing the actual survey findings it is important to have a full profile of the graduates who were interviewed. Of particular importance are demographic characteristics such as sex, age, and race as well as various "programmatic" attributes which reflect vocational education background. These include such characteristics as the type of vocational school attended and the type of occupational training received. In addition, we feel that geographic identifiers are also relevant in that they define the economic environment in which graduates are pursuing employment or education.

We briefly review these characteristics for several reasons. First, the survey of graduates contains a considerable amount of detailed data. To assimilate this information, it is important to hold an accurate image of who the survey respondents are. Secondly, to the extent that readers tend to compare the survey population to students from their own school or region it will be important to know how the characteristics of the populations may differ. Finally, and most critically, previous research and common sense dictate that employment success and perceptions of vocational education will not be uniform across all subgroups of the student population. To understand such variations, we must identify important characteristics which may give rise to noteworthy differences in labor market behavior. Many of the student characteristics described below will be used throughout our analysis to compare key findings across student subgroups (men versus women, or white versus nonwhite) or programs of study.

QUESTION: What are the personal characteristics of the respondent population? (Table 2.1)

The vast majority of survey respondents were white men ages 20-21 years old.

A summary of the survey respondents reveals that slightly over 70 percent were male and 94 percent were white. Those classified as nonwhite were primarily blacks and Hispanics. Statistics made available by the Department of Education indicate that white students comprised approximately 92 percent of the graduating class of 1984. Thus, white students may be slightly overrepresented in the current survey. This should be borne in mind as the reader examines earnings and employment data in particular.

It should also be noted that of the nonwhite respondents a slightly higher proportion were female compared to the white respondents. Available data do not allow us to determine if this is an accurate reflection of the total population or whether it suggests that nonwhite females were more likely to respond to the survey than their white counterparts. Nonetheless, it is also a characteristic of the respondent population that should be considered when comparing the employment success of whites and nonwhites.

Nearly 80 percent of the students were 20-21 years of age with the bulk of the remaining 20 percent falling in the 22-23 category. Since much of our analysis will concern employment success, a more relevant characteristic is the student's year of graduation. Unlike age, their graduating class will more accurately indicate how many postsecondary years the respondent has had to either work, attend school or pursue other activities. The respondent population is quite evenly divided between the class of 1982-83 (52.1 percent) and the class of 1983-84 (47.9 percent). At the time of the survey, the former group had had approximately 39 months to operate in the labor market (or advance their education) compared to 27 months for the latter.

QUESTION: **What are the programmatic characteristics of the respondent population?** (Tables 2.1 and 2.2)

The vocational education community recognizes three basic types of secondary vocational schools: regional vocational/technical schools, city/town vocational/technical schools and comprehensive high schools. Comprehensive vocational high school programs differ from regional and city/town vocational/technical schools in that comprehensive vocational students attend regular academic classes with nonvocational students. Regional schools serve a group of cities and towns; all classes, including academic, are made up of solely "voc students." City/town schools serve one particular city or town, and academic classes, although perhaps part of the regular high school curriculum, consist only of vocational students. These distinctions are significant in the analysis of outcomes since the type of school may influence the overall quality of academics and the relative emphasis on college preparation, as well as the quality of shop equipment and instructors.

Over half of the respondents in the survey graduated from regional vocational/technical schools.

The data indicate that 59.9 percent of the graduates attended a regional vocational/technical school. The remaining students were divided between comprehensive schools (25.2 percent) and city/town vocational/technical schools (14.5 percent).

Personal and Programmatic Characteristics of the Survey Respondents

	N	Percent
Sex		
Male	866	71.6%
Female	344	28.4
Race		
White	1,136	94.0
Black	32	2.6
Hispanic	18	1.5
American Indian	11	0.9
Other/Refused	12	1.0
Approximate Age		
19	7	0.6
20-21	954	79.7
22-23	228	19.0
24-26	8	0.7
Moved > 50 Miles Since Graduation		
Yes	79	6.6
No	1,126	93.4
Year of Graduation		
1982-83	622	52.1
1983-84	571	47.9
Type of Vocational School		
Regional Voc/Tech	729	60.3
City/Town Voc/Tech	175	14.5
Comprehensive	304	25.2
Economic Region		
Metro Boston	746	61.8
Balance of State	462	38.2

Survey respondents represented over fifty occupational fields of study.

Consistent with the overall structure of the vocational education system, the survey respondents represented a broad array of occupational interests and fields of study. For purposes of facilitating the analysis, we grouped the occupations into 14 broad categories which allow for the more ready use of comparisons across occupational areas that would not be possible with fifty smaller categories.

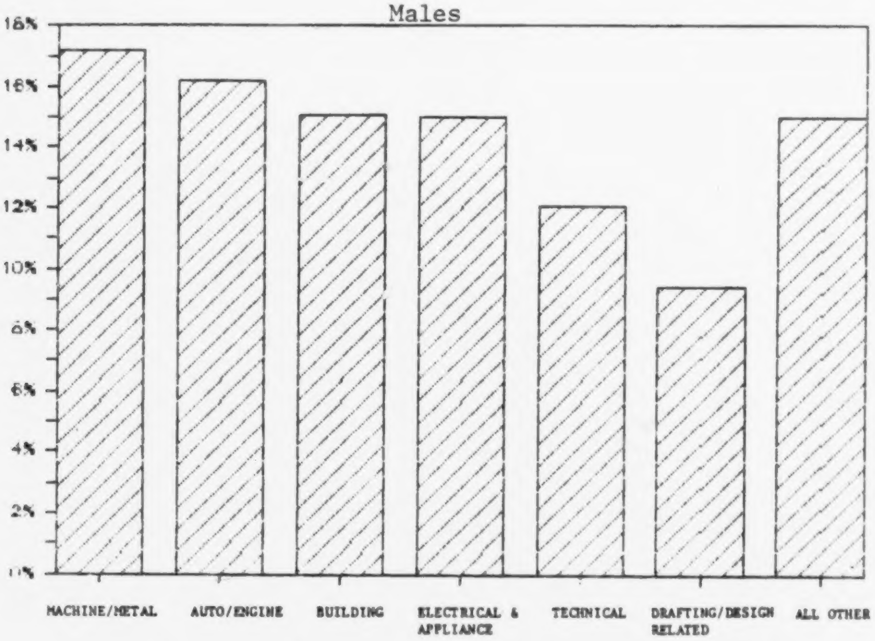
An examination of the data indicate that traditional "blue collar" occupations including building trades, automobile/engine, machine and metal trades, and electrical were the most frequently studied programs, accounting for nearly 50 percent of all respondents.

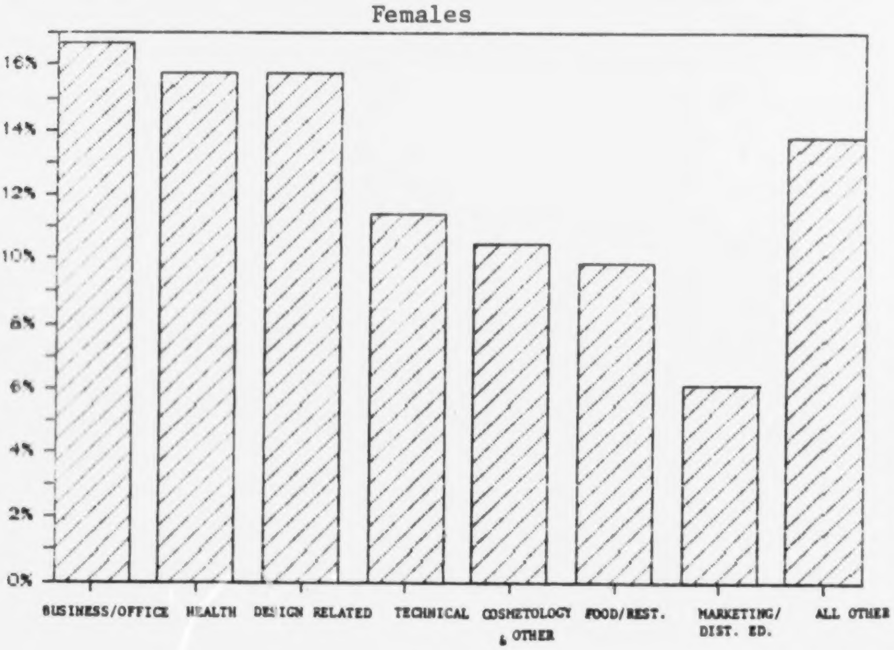
Males and females tended to prepare for quite different occupations.

Further exploration of the data revealed a high degree of clustering by sex both across and within occupational areas. For instance, we note that over 60 percent of the males prepared for the four occupational areas noted above. Similarly, nearly 50 percent of the women studied three fields; health, business and design-related occupations. Clustering within occupations is also particularly noteworthy. "Blue collar" trades, for example, were approximately 99 percent male. Occupations such as business/office, health aide/technician, marketing and distribution education, as well as fashion design, cosmetology and consumer/homemaking, were predominantly female, with women making up 75-100 percent of the graduates in those fields. Again, this is a fact which must be kept in mind when examining the wage and employment data.

It should be stressed, however, that in spite of the high degree of voluntary clustering within occupations, several fields have succeeded in establishing a balanced enrollment of men and women. Most noteworthy is the group of occupations we have classified as "technical," which includes computers, data processing, information management, communications, and electronics. Food and culinary occupations also have a high degree of balance.

Occupational Training of Male and Female Graduates


Males


Females

QUESTION: What are the geographic characteristics of the respondents? (Tables 2.3, 2.4 and SDA Map)

In addition to personal and programmatic characteristics, it is also necessary to note the geographic representation of the respondent population. Of particular importance is the extent to which labor market conditions and employment opportunities vary across different regions of the state. This may have a direct impact on graduates' success in finding employment and the wages that they earn. In addition to identifying the labor market area in which a vocational school operates, it is also necessary to determine if students are seeking employment close to the school or whether they have relocated.

In order to facilitate this analysis, we decided to use existing labor market divisions to identify the geographic/economic positioning of the vocational schools. The most useful were the Service Delivery Area (SDA) designations used in Massachusetts under the Job Training Partnership Act. The state is currently divided into fifteen substate areas which have largely been shaped to coincide with distinct labor market centers.

The largest proportion of survey respondents graduated from schools located in the Metro South/West SDA and the North Middlesex SDA.

These two substate areas which are west and north of Boston account for nearly 30 percent of the respondent population. The smallest representation is from the two western-most areas, with the Berkshire County and Franklin/Hampshire County SDAs accounting for less than 3 percent apiece. Approximately 3 percent of the respondents were vocationally trained in the City of Boston.

In order to facilitate the analysis, we grouped those Service Delivery Areas which were facing similar employment and economic opportunities. Using average wage rates as a summary indicator, we established two economic regions in the state: the Metro Boston Region which consisted of SDAs generally within the Route 495 region, and the Balance of Massachusetts which includes the remaining SDAs. The former economic region is generally characterized by comparatively low unemployment rates and plentiful entry-level employment opportunities. The latter region has experienced slightly higher rates of unemployment and may provide somewhat fewer economic opportunities and lower wages than the labor market in greater Boston.

Throughout this analysis we will compare graduates' employment and wage experiences in these two different economic regions. Differences that are noted may be, in part, attributable to the overall economic conditions of the labor market in which the graduate is located. This information is of course most useful if we can determine whether a high percentage of survey respondents tend to be working in the same general labor market in which their high school is located.

> At the time of the survey, most respondents were still living quite close to home.

The survey of graduates indicated that only 7 percent of the respondents had moved more than 50 miles since graduation. This finding provides two key pieces of information. First, it confirms that geographic classifications (i.e. Service Delivery Areas) based on the location of the school can also serve as indicators of the type of economic environment in which the graduate is operating two to three years later.

Second, these mobility data shed some preliminary light on a public policy concern expressed by both state and local administrators. That is, are vocational education graduates meeting the needs of local employers, or is the system preparing students for a state or national job market? Since, as we note in the next chapter, the majority of respondents were employed, these data suggest that the vocational education system has been generally successful in defining and addressing the local labor market needs.

Summary

The characteristics of the respondent population can be briefly summarized as follows:

- Three out of four respondents were male.
- Approximately one in twenty was nonwhite.[1]

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[1] Data from the Department of Education indicate a slightly higher percentage of non-white graduates. This appears to be due to the fact that schools with significant non-white populations tended to have systematically lower response rates than schools with fewer non-whites. Table 2.4 presents a breakdown of response rate by schools.

- Two out of five nonwhite respondents were female, as compared to one out of four whites.

- Nineteen out of twenty respondents had not moved from the area where they went to school.

- Nearly two thirds of all respondents graduated from a regional voc/tech. One in four attended a comprehensive high school, and the remainder, city/town voc/techs.

- Nearly half of all respondents studied traditional "blue collar" occupations such as building trades, automobile/ engine, machine and metal trades, and electrical.

- Nearly two out of three males studied in the above occupations, as compared to less than 3 percent of all females. Similarly, 3 out of 5 females graduated from either a design, health, consumer, business or marketing occupation.

- Most respondents were between 20 and 21 years old.

Table 2.1

Variation in Personal and Programmatic Characteristics by Sex and Race

(Column Percentages are Shown)

	All Respondents (N=1,210)	Sex		Race	
		Male (N=866)	Female (N=344)	White (N=1,136)	Nonwhite (N=68)
Sex					
Male	71.6	100.0	0.0	72.3	60.3
Female	28.4	0.0	100.0	27.7	39.7
Race					
White	94.3	95.2	92.1	100.0	0.0
Nonwhite	5.6	4.8	7.9	0.0	100.0
Moved > 50 Miles Since Graduation					
Yes	6.6	6.1	7.6	6.6	6.1
No	93.4	93.9	92.4	93.4	93.9
Year of Graduation					
1982-83	52.1	52.0	52.4	52.5	47.1
1983-84	47.9	48.0	47.6	47.5	52.9
Type of Vocational School					
Regional Voc/Tech	60.3	59.5	62.5	61.2	44.1
City/Town Voc/Tech	14.5	16.3	9.9	14.5	14.7
Comprehensive	25.2	24.2	27.6	24.3	41.2
Program Studied in Voc/Tech School					
Agriculture	2.9	3.0	2.6	2.8	4.5
Marketing & Distributive Ed.	2.3	0.8	6.1	2.2	4.5
Health Occupations	4.7	0.2	15.8	4.5	6.0
Consumer & Homemaking	1.4	0.0	5.0	1.5	0.0
Food/Restaurant	5.3	3.5	9.9	5.6	1.5
Business/Office	5.4	0.9	16.7	5.2	9.0
Technical	11.9	12.1	11.4	11.7	16.4
Building Trades	11.0	15.1	0.6	11.1	9.0
Automobile/Engine	11.7	16.2	0.3	11.8	6.0
Machine & Metal Trades	12.5	17.2	0.9	12.6	11.9
Electrical & Appliance	11.0	15.0	0.9	11.1	9.0
Design-Related	11.2	9.4	15.8	11.0	16.4
Custom Finishing	5.0	5.6	3.5	5.0	4.5
Other	3.7	1.0	10.5	3.8	1.5
Economic Region					
Metro Boston	61.8	59.4	67.7	61.6	64.7
Balance of State	38.2	40.6	32.3	38.4	35.3

Note: Although this table indicates that many males and females entered design-related fields, most males were in Drafting and Graphic Communications, while most females entered Commercial Art and Fashion Design programs.

Table 2.2

Vocational School Programs

Program Category	Number	Percent
AGRICULTURE	(35)	(2.9)
Animal Science	8	0.7
Plant Science	6	0.5
Agriculture	13	1.1
Landscaping	8	0.7
MARKETING & DISTRIBUTIVE ED.	(28)	(2.3)
General Merchandise	3	0.2
Distributive Ed.	21	1.7
Marketing & Management	4	0.3
HEALTH OCCUPATIONS	(56)	(4.7)
Health Aide/Technician	56	4.7
CONSUMER & HOMEMAKING	(17)	(1.4)
Childcare	16	1.3
Home Economics	1	0.1
FOOD/RESTAURANT	(64)	(5.3)
Food/Culinary	62	5.1
Restaurant Management	2	0.2
BUSINESS/OFFICE*	(65)	(5.4)
Typing & Related	9	0.7
General Business	51	4.2
Accounting	5	0.4
TECHNICAL	(143)	(11.9)
Computer/Data Processing	53	4.4
Information Communications	8	0.7
Electronics	81	6.7
Other	1	0.1
(CONTINUED)		

*Business programs are not state-approved Chapter 74 programs, but are nonetheless offered in a few regional vocational technical school districts.

Table 2.2
(continued)

Vocational School Programs

Program Category	Number	Percent
BUILDING TRADES	(132)	(11.0)
Carpentry	83	6.9
Masonry	8	0.7
Plumbing & Pipefitting	31	2.6
Construction/Maintenance	8	0.7
Heavy Equipment	2	0.2
AUTOMOBILE/ENGINE	(141)	(11.7)
Automobile Mechanic	98	8.1
Auto Body Repair	33	2.7
Diesel Mechanic	10	0.8
MACHINE & METAL TRADES	(151)	(12.5)
Machine Shop	78	6.5
Sheet Metal	16	1.3
Welding	24	2.0
Metal Fabrication	28	2.3
Marine Industries	5	0.4
ELECTRICAL & APPLIANCE	(132)	(11.0)
Electrical	97	8.1
Air Conditioning	25	2.1
Radio, TV & Appliance	9	0.7
Computer Maintenance	1	0.1
DESIGN-RELATED	(135)	(11.2)
Commercial Art	62	5.1
Fashion Design	14	1.2
Graphic Communications	16	1.3
Drafting	43	3.6
CUSTOM FINISHING	(60)	(5.0)
Upholstery	4	0.3
Painting & Decorating	22	1.8
Cabinet Making	34	2.8
OTHER	(45)	(3.7)
Cosmetology	37	3.1
Plant Maintenance	7	0.6
Teaching	1	0.1

Table 2.3

Vocational School Graduates, by Economic Region

	Survey Respondents		Average Earnings of Workers in the State in 1985	Area Unemployment Rate 1985-86
	Number	Percent		
MASSACHUSETTS	1,210	100%	$19,600	3.9
METRO BOSTON	746	61.8	20,370 (est)	3.7 (est)
Boston City	38	3.1	22,500	4.5
Metro North	105	8.7	21,600	3.3
Metro Southwest	205	17.0	21,100	2.5
Lower Merrimack	74	6.1	18,600	4.4
North Middlesex	146	12.1	21,600	3.8
South Coastal	58	4.8	18,600	3.7
Southern Essex	120	9.9	18,600	3.7
BALANCE OF STATE	462	38.2	16,650 (est)	4.5 (est)
Berkshire County	27	2.2	17,800	4.7
Bristol Consortium	84	7.0	15,600	5.8
Brockton Area	35	2.9	16,000	4.3
Franklin-Hampshire	36	3.0	16,100	3.7
Hampden Consortium	56	4.6	17,300	4.4
New Bedford/Cape	101	8.4	15,200	5.1
North Worcester	39	3.2	17,600	4.2
South Worcester	84	7.0	17,600	3.8

Source: Graduate Survey and Massachusetts Office of Training and Employment Policy.

Table 2.4

Response Rates and Economic Region, by School of Graduation

School	Total # in Sample	# of Survey Respondents	Response Rate	SDA[1]	Economic Region[2]
All Schools	1,994	1,210	60.7%	--	--
City/Town Voc-Techs	300	175	58.3	--	--
Dean (Holyoke)	9	4	44	6	B
Lynn	48	35	73	14	A
Springfield (Putnam)	55	27	49	6	B
Waltham	20	10	50	8	A
Westfield	12	7	58	6	B
Weymouth	21	14	67	13	A
Northampton	24	19	79	5	B
Worcester/Fanning Trade	62	37	60	15	B
Somerville	17	10	59	7	A
Pittsfield	32	12	38	1	B
Regional Voc-Techs	1,138	729	64.1	--	--
Assabet Valley	65	45	69	8	A
Blackstone Valley	31	21	68	15	B
Blue Hills	49	37	76	8	A
Bristol Plymouth	33	17	52	3	B
Cape Cod	25	14	56	10	B
Quinobin	7	4	57	8	A
Franklin	26	17	65	5	B
Gr. Fall River	42	30	71	3	B
Gr. Lawrence	69	39	57	9	A
Gr. New Bedford	71	46	65	10	B
Gr. Lowell	92	60	65	11	A
So. Middlesex (Keefe)	44	25	57	8	A
Minuteman	43	26	60	8	A
Montachusett	38	30	79	12	B
No. Berkshire	20	15	75	1	B
Nashoba	32	21	66	11	A
Northeast	58	39	67	7	A
No. Shore	22	12	55	14	A
Old Colony	25	20	80	10	B
Pathfinder	18	12	67	6	B
Shawsheen Valley	77	48	62	11	A
So. Eastern Reg.	51	35	69	4	B
So. Worcester	36	21	58	15	B
Tri County	40	23	58	8	A
Upper Cape	21	9	43	10	B
Whittier	55	35	64	9	A
Bristol Ag.	9	5	56	3	B
Essex Ag.	12	6	50	14	A
Norfolk Ag.	14	10	71	8	A
So. Shore	13	7	54	13	A

Table 2.4
(continued)

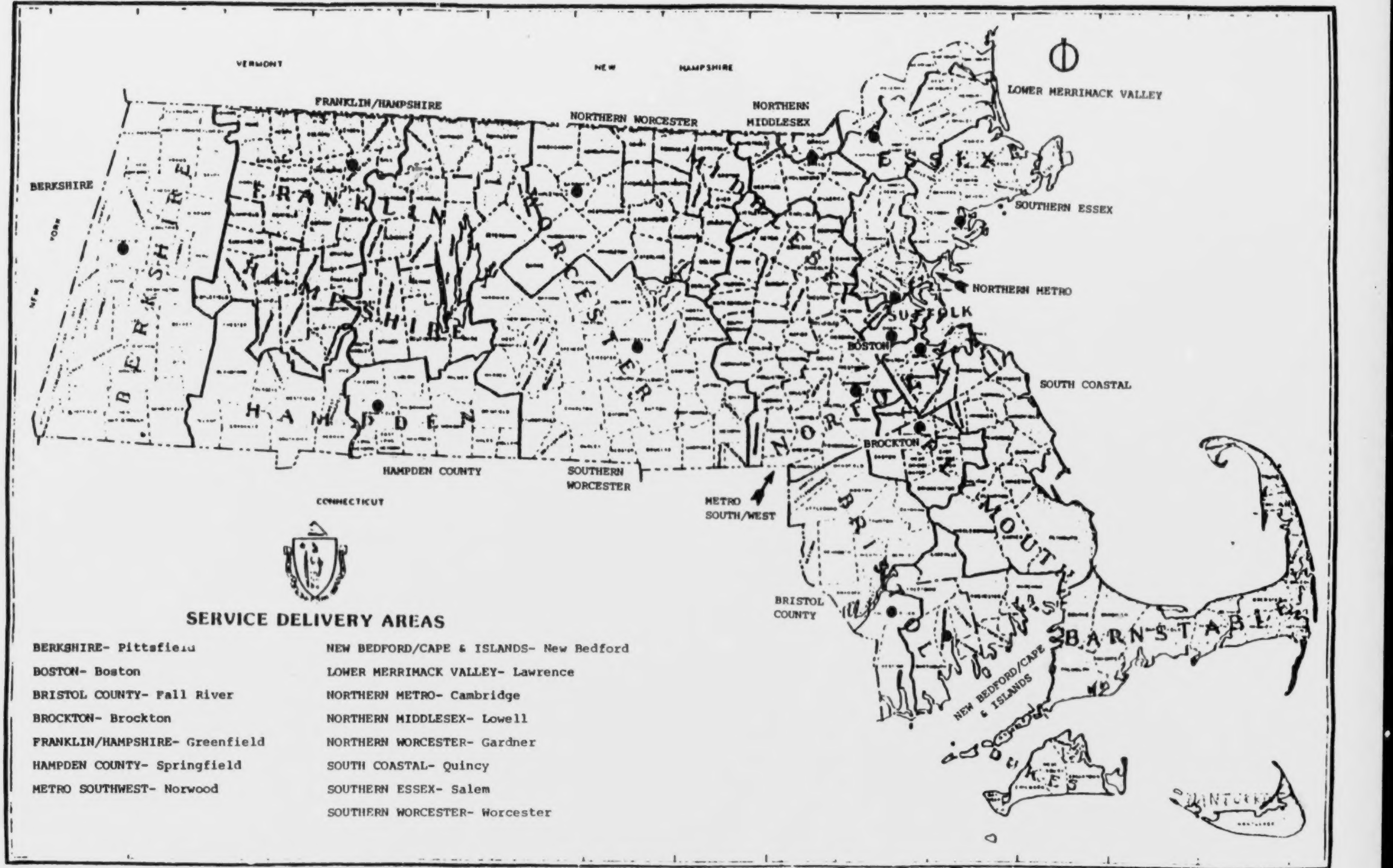
Response Rates and Economic Region, by School of Graduation

School	Total # in Sample	# of Survey Respondents	Response Rate	SDA[1]	Economic Region[2]
Comprehensive High Schools	556	304	54.7%	--	--
Everett	11	7	64	7	A
Leominster	12	9	75	12	B
Medford	19	12	63	7	A
Norwood (Peabody)	2	2	100	8	A
Beverly (Patten)	11	4	36	14	A
Boston (Humphrey)	95	38	40	2	A
Camb. Rindge & Latin	7	5	71	7	A
Chicopee	14	6	43	6	B
Fall River (Durfee)	16	10	63	3	B
Newton	23	16	70	8	A
Quincy	35	20	57	13	A
Dighton Rehoboth	11	8	73	3	B
King Philip	15	9	60	8	A
Silver Lake	15	7	47	13	A
Tantasqua	5	5	100	15	B
Northbridge	1	0	0	15	B
Gloucester	26	17	65	14	A
Plymouth Carver	26	14	54	13	A
Attleboro	22	14	64	3	B
Wakefield	9	3	33	7	A
Danvers	26	13	50	14	A
Martha's Vineyard	26	12	46	10	B
Marshfield	26	10	38	13	A
Billerica	26	17	65	11	B
Salem	26	17	65	14	A
Watertown	26	17	65	7	A
Revere	25	12	48	7	A

[1] SDAs:
1=Berkshire County
2=Boston City
3=Bristol County
4=Brockton
5=Franklin-Hampshire
6=Hampden County
7=Metro North
8=Metro South West
9=Lower Merrimack
10=New Bedford-Cape Cod
11=Northern Middlesex
12=Northern Worcester
13=South Coastal
14=Southern Essex
15=Southern Worcester

[2] Economic Region: A=Metro Boston B=Balance of State

SDA Map


VERMONT
NEW HAMPSHIRE
FRANKLIN/HAMPSHIRE
NORTHERN WORCESTER
NORTHERN MIDDLESEX
LOWER MERRIMACK VALLEY
ESSEX
SOUTHERN ESSEX
BERKSHIRE
NEW YORK
FRANKLIN
HAMPSHIRE
WORCESTER
MIDDLESEX
NORTHERN METRO
SUFFOLK
BOSTON
SOUTH COASTAL
HAMPDEN
NORFOLK
BROCKTON
HAMPDEN COUNTY
SOUTHERN WORCESTER
CONNECTICUT
METRO SOUTH/WEST
BRISTOL
PLYMOUTH
BRISTOL COUNTY
BARNSTABLE
NEW BEDFORD/CAPE & ISLANDS
DUKES
NANTUCKET

SERVICE DELIVERY AREAS

BERKSHIRE- Pittsfield
BOSTON- Boston
BRISTOL COUNTY- Fall River
BROCKTON- Brockton
FRANKLIN/HAMPSHIRE- Greenfield
HAMPDEN COUNTY- Springfield
METRO SOUTHWEST- Norwood

NEW BEDFORD/CAPE & ISLANDS- New Bedford
LOWER MERRIMACK VALLEY- Lawrence
NORTHERN METRO- Cambridge
NORTHERN MIDDLESEX- Lowell
NORTHERN WORCESTER- Gardner
SOUTH COASTAL- Quincy
SOUTHERN ESSEX- Salem
SOUTHERN WORCESTER- Worcester

CHAPTER 3

CURRENT LABOR FORCE STATUS OF VOCATIONAL EDUCATION GRADUATES

The purpose of this chapter is to provide a "snapshot" of the graduates' labor force status at the time of the follow-up interview which took place in the fall of 1986. The survey focused in particular on whether the students were employed (working part-time or full-time), in school, or unemployed (not working but actively seeking employment). In addition, we were able to isolate those who were self-employed, in the military, or out of the labor force altogether.

Since successful employment is such a critical indicator of the performance of vocational education, we will also examine the respondents who were working in somewhat greater detail. Of particular interest are the wages that they were earning and the extent to which their employment was related to their vocational education training.

The discussion will be organized around a number of key research questions.

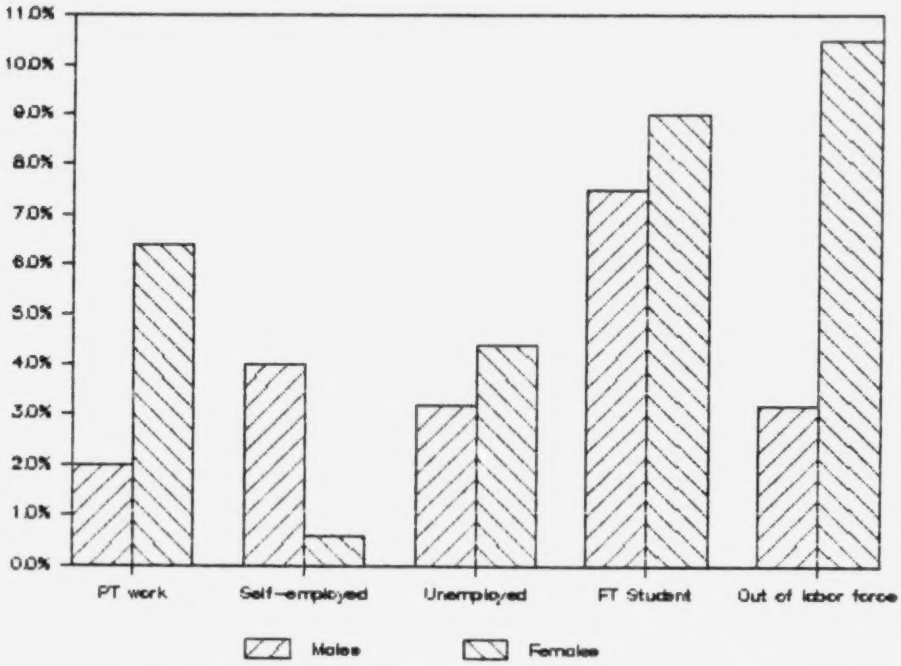
QUESTION: **What were the graduates doing at the time of the survey?** (Table 3.1-3.2)

The vast majority of the graduates were employed at the time of the survey. Most of those who were not working were full-time students.

Over three out of four survey respondents (77 percent) were working full-time at the point of the survey. An additional 3 percent were part-time workers, 3 percent self-employed and another 1 percent in the military. In total, nearly 85 percent of the survey respondents were employed in some manner.

In spite of extremely high overall rates of employment there were several differences that were noted across subgroups of the respondent population. We found that female graduates in the survey were somewhat less likely than males to be engaged in full-time work (69.1 percent versus 80.1 percent). Conversely, females were comparatively more likely to be working part-time. In particular, over 6 percent of the female respondents were in part-time employment compared to 2 percent of the males. Finally, it should be noted that females were more likely to be out of the work force entirely. Most likely this entailed working at home and caring for children.

Current Activities of Graduates Not Working Full-Time



Rates of full-time employment also appeared to vary considerably by the graduates' program of study. Several occupational areas experienced rates of full-time employment in excess of 80 percent. These included machine and metal trades, automobile/engine, business and office, electrical and appliance and building trades. In contrast however, graduates from a number of occupational areas reported full-time employment rates that were less than 65 percent. These included marketing and distributive education, health occupations, agriculture, and consumer/homemaking.

Further examination of the data, however, suggests that the differences in labor force participation observed across the graduates' program of study are largely explained by enrollment in postsecondary programs, not unemployment at the time of the survey. Overall, we noted that approximately 8 percent of the graduates interviewed were full-time students at the time of the survey. However, when examined across programs of study, it appears that those graduating from traditional "blue collar" trades (building trades, automobile/engine, machine and metal trades, electrical and appliance) were much less likely to have been full-time students in the fall of 1986. For the most part, these are the very same occupations experiencing comparatively high rates of full-time employment. In contrast, health, consumer/homemaking, and technical trades produced above average rates of full-time postsecondary school attendance (12.5 percent, 11.8 percent, and 20 percent respectively), and thus somewhat lower rates of full-time employment.

> Unemployment was not a significant problem for the graduates as a whole; however, the incidence of unemployment was somewhat greater among racial minorities.

Overall, 3.6 percent of the respondents were unemployed (i.e. not employed and actively seeking work). Although the incidence of unemployment was relatively minor, there were several differences among subgroups of the respondent population. Most noteworthy was the incidence of unemployment among racial minorities which was nearly two and one half times that of white graduates. Also, unemployment was somewhat more frequent among the class of 1983 than the class of 1984 (4.5 versus 2.6 percent). This is partly explained by the fact that older students were more likely to have finished any postsecondary schooling and were more likely to be actively seeking employment.

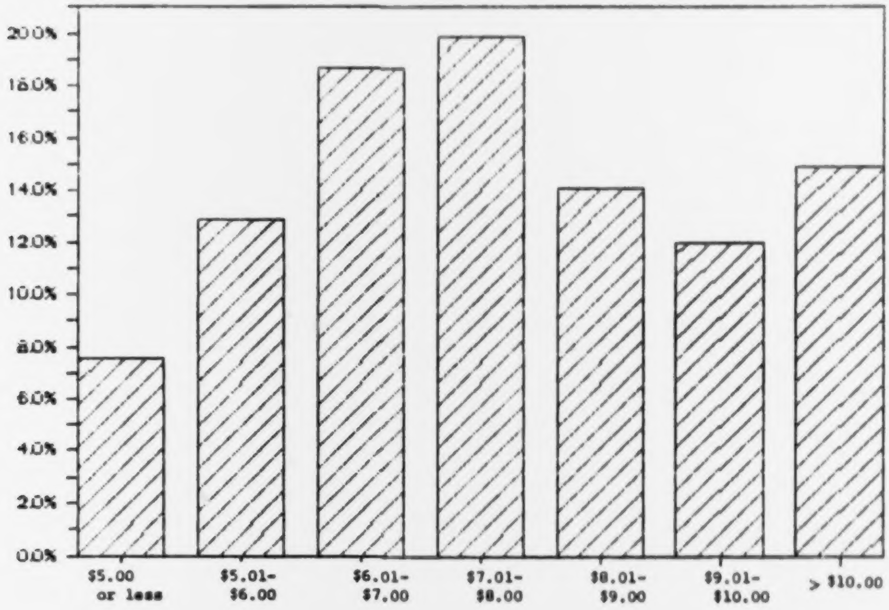
Finally, the incidence of unemployment in the metro-Boston region (3.0 percent) was somewhat lower than in the balance of the state (4.6 percent). This is certainly consistent with the overall economic trends in the state in which the greatest growth in employment opportunities have been in the greater Boston area.

QUESTION: **How much are vocational education graduates being paid in their current jobs?** (Tables 3.3-3.4)

> Full-time workers are paid, on average, in excess of $8.00 per hour. Graduates employed part-time reported a somewhat lower wage of $6.36 per hour.

The vast majority (91 percent) of survey respondents who were employed were working in full-time positions. It appears that these graduates were able to secure relatively well paying jobs, averaging $8.14 per hour. In spite of the overall success achieved by the respondents as a whole however, approximately 20 percent earned less than $6.00 per hour. One employer commented, "They [vocational education graduates] have extremely optimistic salary expectations for entry level positions and egos that don't allow them to easily accept the work available to them." While this may be true of some graduates, it appears that most graduates are in fact able to find satisfactory employment at quite reasonable wages.

Current Hourly Wage: Full-Time Workers

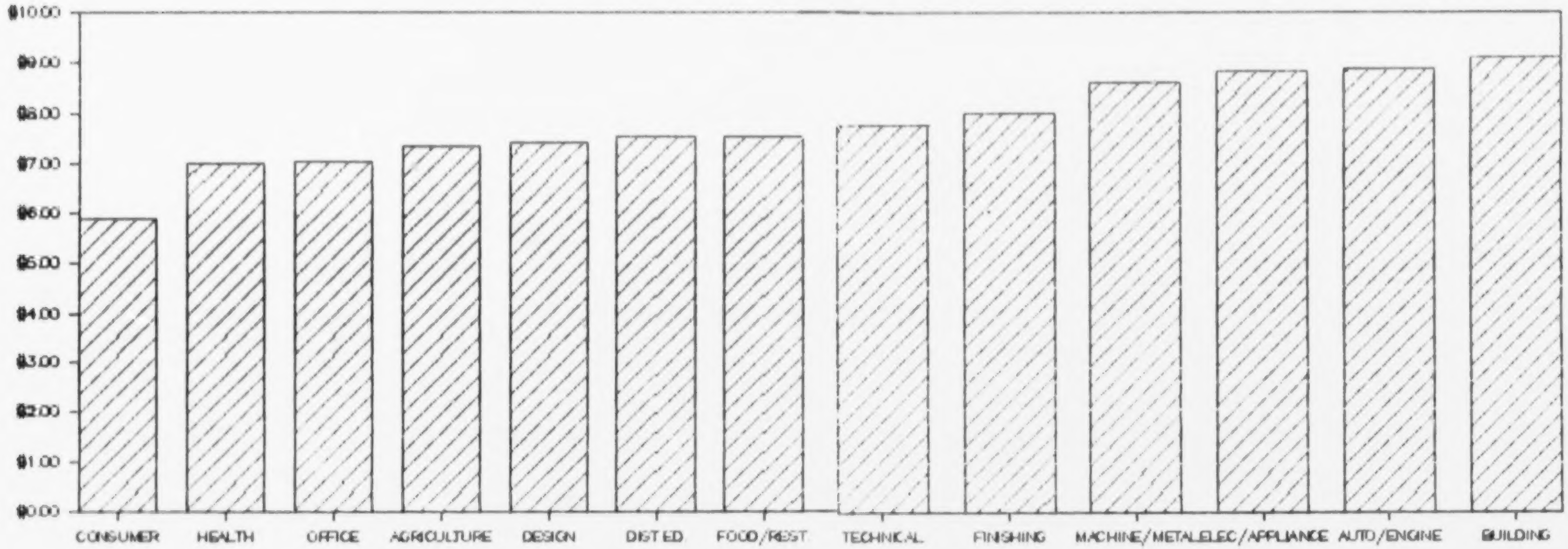


The small percentage of graduates who reported part-time employment earned considerably less, averaging $6.36 per hour. An even smaller percentage of respondents reported that they were self-employed at the time of the survey. Although their reported average wage of $19.61 per hour was quite high, the data must be interpreted with caution since it is not clear how they calculated an hourly wage.

The wages of full-time workers varied considerably by the occupations studied in school.

There appears to be considerable variation in the hourly wages of full-time workers across the various vocational education programs. The reported average hourly wages spanned a $3.00 per hour range, with a high of $9.13 in the building trades to a low of $5.90 in consumer and homemaking. In general, it appears that the traditional "blue collar" occupations generated the highest hourly wage rates; graduates of automobile/engine, machine and

Average Hourly Wage by Program Studied



metal, electrical and appliance, and building trades all averaged in excess of $8.60 per hour. Converted to an annual basis, it is estimated that graduates from these occupations, on average, are earning between $17,930 and $18,990. Only one out of every seven graduates in these occupations reported hourly wages of less than $6.00 per hour.

In contrast, there are a number of occupational areas in which the reported average hourly wages ranged from $5.90 to $7.00 per hour. These included consumer/homemaking, health occupations, business/office, and cosmetology (included in the "other" category). Estimated average annual earnings of graduates who studied in these programs ranged from $12,300 to $14,600. Only about one out of five respondents completing these vocational programs reported wages in excess of $8.00 per hour.

Falling midway along the hourly wage spectrum were graduates from the following vocational programs: agriculture, design-related, marketing and distributive education, food and restaurant, and technical occupations. The distribution of average hourly earnings is displayed graphically below.

A slight wage advantage was held by those who graduated from city/town vocational schools. The difference amounted to approximately $0.27 per hour above that of graduates of regional high schools and $0.22 higher than graduates of comprehensive high schools.

QUESTION: Do wages appear to vary according to the sex or race of the graduate? (Tables 3.3-3.4)

> The difference in the wages reported by males and females is striking. The average hourly wage for female workers is $6.65, as compared to $8.64 for their male counterparts.

Half of all male workers were earning more than $8.00 per hour at the time of the survey. Fewer than one in six females were earning at this level. Conversely, 41 percent of all full-time female workers earned $6.00 or less compared to only 13 percent of all male workers.

The differences between the wages earned by men and women appear to be strongly related to the self-selection process which resulted in clustering by sex within occupations studied. As was noted earlier, men tended to prepare for the traditional "blue collar" occupations associated with higher wage positions. Females tended to prepare for occupations that pay comparatively lower wages.

With respect to race, it is interesting to note that the average wage of minorities was nearly identical to that of white graduates. This is true despite the fact that a somewhat higher proportion of minority graduates were female. The average hourly wage for minority graduates was $8.10 compared to $8.15 for white survey respondents. An examination of the wage distribution indicated that similar proportions of white and nonwhite populations were earning above $8.00 per hour (41 percent and 38 percent respectively) and below $6.00 per hour (18 percent and 19 percent respectively). It must be stressed that these figures should be interpreted with caution due to the small absolute number (42) of minority respondents who were employed full-time.

QUESTION: Are the jobs currently held by graduates related to their vocational education training? (Table 3.5)

Among vocational education policymakers and practitioners there is considerable debate over the importance of "training relatedness" as a measure of success of graduates' employment. Some argue that a primary goal of the system is to place graduates in jobs which draw directly upon their vocational training. Only then will resources be used effectively. If many jobs are not related to the occupations studied, changes may be required in the curriculum or the job development and placement effort.

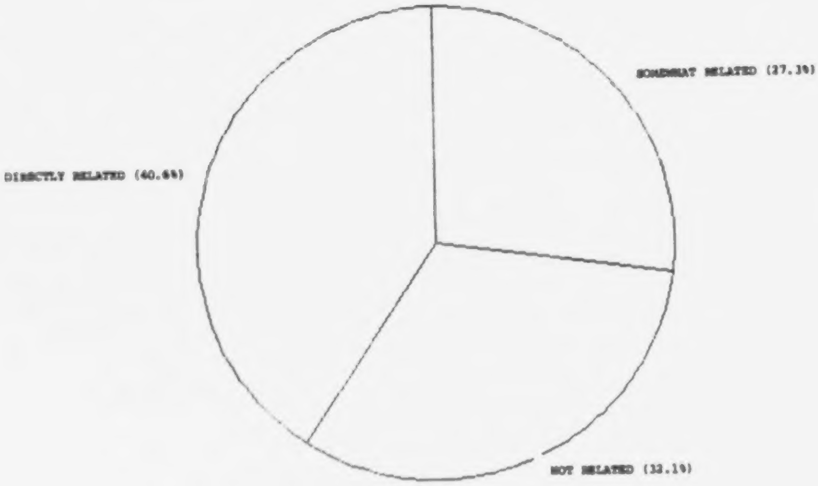
On the other hand, it can just as readily be suggested that occupational switching reflects the realities of local employment opportunities and the often ephemeral nature of teenagers' decision-making processes. Furthermore, it has been argued that some of the most valuable lessons learned in vocational education are not occupationally specific (e.g. work attitudes and habits, responsibility), which clearly minimizes the importance of a "training related" placement. Many comments of both graduates and employers reflected the importance of more general, widely applicable "abilities" acquired in vocational high school programs. As one satisfied former drafting student put it, "Voc teaches you how to think and use your mind, no matter what the trade."

With this as background we will simply report graduates' perceptions as to whether their current positions were related to their field of vocational study.

According to the survey respondents, two out of every three jobs were either "directly related" (39 percent) or "somewhat related" (27 percent) to their vocational education training.

One out of three jobs was reported to be unrelated to the graduate's field of study; some information regarding the reason for this is presented in Table 3.5. As can be seen, the two most frequently cited reasons included "preferred another job" and "better pay."

Relatedness of Training to Full-Time Employment



It should also be noted that there was some variation in securing training related positions across the program of study. Over three out of four respondents who studied marketing and distributive education, business and office, building trades, and machine/metal trades reported working in a training related position. Graduates in agriculture (42 percent), health aide/technician (53 percent), design-related (52 percent) and custom finishing (46 percent) reported somewhat lower rates of training related employment.

QUESTION: **Do training related jobs pay better than other full-time jobs?** (Table 3.6)

Wages reported by workers in training related positions were, on average, higher than those of other graduates.

In fact, the average hourly wage of respondents steadily decreased as the positions became less training related. The following average hourly wages were reported:

Directly related	$8.60 per hour
Somewhat related	$8.11 per hour
Not related	$7.57 per hour

Further exploration of the data suggests that training relatedness has the strongest influence on wages of graduates from the "high wage" occupational categories. The largest differences were noted in the traditional "blue collar" occupations, with those in training related positions holding a clear wage advantage over their counterparts who studied these occupations but were employed in less directly related positions. This is logical since the graduate of a high wage "blue collar" occupation would be likely to find the most lucrative opportunities in a "blue collar" training related position. Those trained in a "blue collar" trade who secure employment not related to their field are very likely to find themselves in lower paying occupations requiring less specific technical training. In lower paying positions, it appears that training relatedness has little consistent influence on wages.

QUESTION: **Are current postsecondary school programs related to vocational programs studied at the secondary level?** (Table 3.7-3.8)

As noted earlier in the chapter, approximately 20 percent of the respondents were currently enrolled in some form of educational program. Less than half of these were full-time students at the time of the survey. Similar to the concept of training related employment, we asked graduates what they were studying to review whether or not their current studies were an extension of their high school vocational preparation.

> Overall, approximately 40 percent of the graduates were pursuing an education that was a general extension of their secondary school program of study.

Approximately 30 percent of postsecondary enrollees were in technical fields such as engineering or computers. Another 30 percent were enrolled in a variety of business, accounting and management courses. Graduates from business, technical and building trades at the secondary level appear to be the most likely to continue their education in a related discipline. Vocational graduates in both training related and unrelated postsecondary programs had positive comments on the background they received in their vocational high school. A computer science graduate commented, "I am a full-time college student continuing my studies in my high school major. My school gave me an excellent background for my technical area...it has definitely been an advantage in college." Similarly, a sheet metal graduate now studying engineering reported that "because I am enrolled in a four year engineering program, I have not been using my skills as much as my education. My educational background served me well because the voc allowed me to learn at my own pace...my vocational education has backed me extremely well because of my knowledge of machinery and metal fabricating processes."

Summary

The mid-1980s are a particularly opportune time for recent vocational education graduates in Massachusetts. The state's economy has consistently outpaced that of the nation--personal income has grown rapidly, while the unemployment rate has been the lowest among the large industrial states for the last three years. An examination of graduates' current labor force status suggests that they have fared quite well in this economy. The vast majority were employed full-time in jobs which for the most part were directly or somewhat related to their vocational preparation. On average, the graduates were quite well paid, averaging in excess of $8.00 per hour. It should be noted however that women, on average, earned considerably less than men. The majority of graduates not working were attending school. Finally, it should be noted that unemployment affected only a small portion of the survey respondents.

Status at Time of Survey (Fall, 1986)

(Row Percentages are Shown)*

	Full-Time Work	Part-Time Work (Not a Full-Time Student)	Self-Employed (Not a Full-Time Student)	Full-Time Student (Not a Full-Time Worker)	Unemployed (Not a Full-Time Student)	Military (Not a Full-Time Student)	Not Working (Not a Full-Time Student)
All Respondents (N=1,207)	77.0	3.2	3.1	8.0	3.6	1.0	4.2
Sex (N=1,207)							
Male	80.1	2.0	4.0	7.5	3.2	1.2	2.0
Female	69.1	6.4	0.6	9.0	4.4	0.6*	9.9
Race (N=1,201)							
White	77.8	3.2	3.3	7.6	3.2	1.0	4.1
Nonwhite	66.2	4.4	0.0*	13.2	8.8	1.5*	5.9*
Moved > 50 Miles Since Graduation (N=1,202)							
Yes	57.7	6.4	0.0*	11.5	10.3	7.7	6.4
No	78.4	3.0	3.3	7.6	3.1	0.5	4.1
Year of Graduation (N=1,190)							
1982-83	77.6	3.6	3.6	5.5	4.5	1.3	4.0
1983-84	76.5	3.0	2.5	10.2	2.6	0.7*	4.6
Type of Vocational School (N=1,205)							
Regional Voc/Tech	76.5	4.0	3.0	8.4	3.0	0.6*	4.5
City/Town Voc/Tech	78.7	2.3*	4.0	2.9	6.3	1.2*	4.6
Comprehensive	77.0	2.0	2.6	9.9	3.3	2.0	3.3
Program Studied in Voc/Tech School (N=1,201)							
Agriculture	62.9	11.4*	2.9*	8.6*	0.0*	2.9*	11.4*
Marketing & Distributive Ed.	55.6	11.1*	3.7*	7.4*	3.7*	7.4*	11.1*
Health Occupations	62.5	10.7	0.0*	12.5	3.6*	0.0*	10.7*
Consumer & Homemaking	64.7	5.9*	0.0*	11.8*	5.9	0.0*	11.8*
Food/Restaurant	73.4	3.1*	1.6*	4.7*	9.4	3.1*	4.7*
Business/Office	82.8	1.6*	1.6*	9.4	1.6*	0.0*	3.1*
Technical	70.6	1.4*	1.4*	20.0	3.5	1.4*	2.1*
Building Trades	84.1	0.0*	6.1	4.6	1.5*	1.5*	2.3*
Automobile/Engine	83.7	2.1*	5.0	2.1*	3.6	0.0*	3.6
Machine & Metal Trades	83.4	0.0*	4.6	4.6	6.6	0.0*	0.7*
Electrical & Appliance	86.4	2.3*	3.8	3.8	2.3*	0.8*	0.8*
Design-Related	72.4	5.2	1.5*	10.4	3.0*	1.5*	6.0
Custom Finishing	75.0	6.7*	3.3*	6.7*	5.0*	0.0*	3.3*
Other	66.7	6.7*	0.0*	8.9*	0.0*	0.0*	17.8
Economic Region							
Metro Boston	77.0	3.4	3.1	8.9	3.0	0.9	3.8
Balance of State	76.8	3.0	3.0	6.5	4.6	1.1	5.0

*Indicates less than 5 observations in cell.

Table 3.2

Characteristics of the Unemployed (Not Working--Looking for Work)

(Row Percentages are Shown)

	Unemployed		Time Since Last Job		
	N	Percent	Last Six Months	6-12 Months Ago	More than 2 Years Ago
TOTAL	43	3.6%	69.8	16.3	14.0
Sex					
Male	28	3.2	82.1	17.9	0.0
Female	15	4.4	46.7	13.3	40.0
Race					
White	36	3.2	72.2	16.7	11.1
Nonwhite	6	8.8	50.0	16.7	33.3
Moved > 50 Miles Since Graduation					
Yes	8	10.3	87.5	12.5	0.0
No	35	3.1	65.7	17.1	17.1
Year of Graduation					
1982-83	28	4.5	75.0	14.3	10.7
1983-84	15	2.6	60.0	20.0	20.0
Type of Voc. School					
Regional Voc/Tech	22	3.0	81.8	4.6	13.6
City/Town Voc/Tech	11	6.3	54.6	36.4	9.1
Comprehensive	10	3.3	60.0	20.0	20.0
Program Studied in Voc/Tech School					
Agriculture	0	0.0	---	---	---
Marketing & Distributive Ed.	1	3.7	0.0	0.0	100.0
Health Occupations	2	3.6	0.0	50.0	50.0
Consumer & Homemaking	1	5.9	100.0	0.0	0.0
Food/Restaurant	6	9.4	66.7	16.7	16.7
Business/Office	1	1.6	100.0	0.0	0.0
Technical	5	3.5	80.0	0.0	20.0
Building Trades	2	1.5	100.0	0.0	0.0
Automobile/Engine	5	3.6	80.0	20.0	0.0
Machine & Metal Trades	10	6.6	90.0	10.0	0.0
Electrical & Appliance	3	2.3	66.7	33.3	0.0
Design-Related	4	3.0	25.0	25.0	50.0
Custom Finishing	3	5.0	66.7	33.3	0.0
Other	0	0.0	---	---	---
Job or School One Year Ago					
Job	31	2.9	77.4	22.6	0.0
Military	2	6.9	100.0	0.0	0.0
Full-Time School	1	1.9	100.0	0.0	0.0
Other, including Unemployed	9	18.8	33.3	0.0	66.7
Economic Region					
Boston Metro	22	3.0	77.3	9.1	13.6
Balance of State	21	4.6	61.9	23.8	14.3

Table 3.3

Current Hourly Wages

	Full-Time		Part-Time		Self-Employed	
	N	Avg. Wage	N	Avg. Wage	N	Avg. Wage
ALL WORKERS	856	$8.14	36	$6.36	29	$19.61
Sex						
Male	641	8.64	16	7.03	27	20.38
Female	215	6.65	20	5.82	2	9.25
Race						
White	812	8.15	33	6.44	29	19.61
Nonwhite	42	8.10	3	5.50	0	---
Moved > 50 Miles Since Graduation						
Yes	43	7.35	4	6.62	0	---
No	812	8.18	32	6.32	29	19.61
Year of Graduation						
1982-83	441	8.37	19	7.14	19	21.24
1983-84	403	7.89	17	5.49	9	17.25
Type of Vocational School						
Regional Voc/Tech	514	8.09	27	6.45	17	19.25
City/Town Voc/Tech	125	8.36	4	6.79	4	34.25
Comprehensive	215	8.14	5	5.53	8	13.07
Program Studied in Voc/Tech School						
Agriculture	20	7.35	4	5.34	1	9.50
Marketing & Distributive Ed.	13	7.51	3	5.45	1	9.00
Health Occupations	33	6.99	6	6.50	0	---
Consumer & Homemaking	11	5.90	0	---	0	---
Food/Restaurant	44	7.51	2	6.50	1	10.00
Business/Office	48	7.03	1	2.02	1	9.50
Technical	94	7.75	2	7.62	1	8.00
Building Trades	100	9.13	0	---	6	23.17
Automobile/Engine	110	8.90	3	6.80	7	19.18
Machine & Metal Trades	117	8.62	0	---	3	29.17
Electrical & Appliance	105	8.83	3	11.45	4	25.52
Design-Related	89	7.40	6	5.81	2	15.00
Custom Finishing	43	8.01	4	5.64	2	15.00
Other	25	6.65	2	4.87	0	---
Economic Region						
Metro Boston	521	8.42	23	7.11	19	17.67
Balance of State	333	7.71	13	5.03	10	23.30

Full-Time Workers: Hourly Wages and Characteristics
(Row Percentages are Shown)

	N	Average Wage	Standard Deviation	$5 or Less	$5.01-6.00	$6.01-7.00	$7.01-8.00	More than $8.00
ALL WORKERS	856	8.14	2.66	7.6	12.9	18.7	19.9	41.0
Sex								
Male	641	8.64	2.74	4.4	9.0	16.2	20.8	49.6
Female	215	6.65	1.69	17.2	24.2	26.0	17.2	15.4
Race								
White	812	8.15	2.67	7.6	12.8	18.4	20.1	41.1
Nonwhite	42	8.10	2.31	4.8	14.3	26.2	16.7	38.1
Moved > 50 Miles Since Graduation								
Yes	43	7.35	2.09	7.0	30.2	14.0	18.6	30.2
No	812	8.18	2.68	7.6	12.0	19.0	19.8	41.6
Year of Graduation								
1982-83	441	8.37	3.02	7.5	11.8	18.4	20.2	42.2
1983-84	403	7.89	2.20	7.9	14.1	18.6	19.4	40.0
Related to High School Vocational Program								
Directly	350	8.60	2.91	6.0	7.7	16.9	19.1	50.3
Somewhat	237	8.11	2.45	5.9	11.4	21.1	23.6	38.0
Not at All	269	7.57	2.37	11.2	20.8	19.0	17.5	31.6
Type of Vocational School								
Regional Voc/Tech	514	8.09	2.75	8.2	13.0	18.7	18.7	41.4
City/Town Voc/Tech	125	8.36	2.56	8.8	12.0	12.0	20.0	47.2
Comprehensive	215	8.14	2.49	5.6	12.1	22.8	22.8	36.7
Program Studied in Voc/Tech School								
Agriculture	20	7.35	2.39	20.0	20.0	10.0	5.0	45.0
Marketing & Distributive Ed.	13	7.51	2.03	7.7	23.1	15.4	30.8	23.1
Health Occupations	33	7.00	1.89	12.1	21.2	27.3	21.2	18.2
Consumer & Homemaking	11	5.90	1.10	36.4	27.3	27.3	9.1	0.0
Food/Restaurant	44	7.51	2.83	15.9	15.9	20.4	13.6	34.1
Business/Office	48	7.03	1.50	8.3	20.8	29.2	25.0	16.7
Technical	94	7.75	1.89	2.1	13.8	21.3	29.8	33.0
Building Trades	100	9.13	2.65	3.0	6.0	15.0	19.0	57.0
Automobile/Engine	110	8.90	3.78	4.6	10.0	17.3	12.7	55.4
Machine & Metal Trades	117	8.62	2.43	3.4	11.1	13.7	18.8	53.0
Electrical & Appliances	105	8.83	2.57	5.7	6.7	15.2	22.9	49.5
Design-Related	89	7.40	2.34	12.4	16.8	23.6	21.4	25.8
Custom Finishing	43	8.01	2.40	14.0	14.0	11.6	20.9	39.5
Other	25	6.65	1.52	16.0	20.0	32.0	12.0	20.0
Economic Region								
Metro Boston	521	8.42	2.79	5.4	9.6	18.8	22.6	43.6
Balance of State	333	7.71	2.38	11.1	17.4	18.6	15.6	37.2

Table 3.5

Relatedness of Training to Current Job

(Row Percentages are Shown)*

	(N)	Relatedness of Training to Current Job							
		Directly Related	Somewhat Related	NOT RELATED (Reason)					
				Preferred Other Job	Not Prepared	No Job Offer	Better Pay	In-School Job	Other
All Workers	(1,088)	38.7	27.3	6.4	2.7	3.9	5.9	2.1	13.0
By Vocational Program									
Agriculture	(31)	25.8	16.1	19.7*	0.0*	3.2*	9.7*	0.0	35.6
Marketing/Distributive Ed.	(23)	30.4	47.8	8.7*	0.0*	0.0*	0.0*	0.0*	13.0*
Health/Aide Tech.	(47)	25.5	27.7	8.5*	0.0*	6.4*	8.5*	6.4*	17.0
Consumer/Homemaker	(12)	25.0*	41.7	0.0*	0.0*	8.3*	8.3*	0.0*	16.7*
Food/Restaurant	(54)	44.4	18.5	5.6*	5.6*	0.0*	9.3	3.7*	13.0
Business/Office	(62)	29.0	48.4	3.2*	0.0*	3.2*	3.2*	0.0*	12.9
Computer/Technical	(125)	28.0	40.8	4.8	5.6	2.4*	5.6	5.6	7.2
Building Trades	(127)	55.9	22.8	5.5	2.4*	1.6*	3.9	0.0	7.9
Automobile/Engine	(131)	44.3	22.9	8.4	2.3*	5.3	5.3	0.0	11.5
Machine & Metal	(138)	46.4	28.3	3.6	3.6	2.9*	5.1	0.7*	11.6
Electrical & Appliance	(128)	47.7	21.1	7.0	3.9	3.1*	3.1*	1.6*	12.5
Design-Related	(120)	30.0	22.5	4.2	2.5*	9.2	7.5	5.0	19.2
Custom Finishing	(54)	22.2	24.1	9.3	1.9*	7.4*	7.4*	3.7	24.0
Other	(36)	33.3	16.7	19.4	0.0*	2.8*	16.7	0.0*	11.1*
Economic Region									
Metro Boston		38.1	28.2	6.6	2.8	3.0	5.8	1.8	13.6
Balance of State		40.0	25.8	6.0	2.4	5.6	6.0	2.7	11.6

		Directly Related	Somewhat Related	Not Related
By Type of Job				
Full-time	(928)	40.6	27.3	32.1
Part-time	(39)	25.6	15.4	59.0
Self-employed	(37)	40.5	35.1	24.3

*Indicates less than 5 observations in cell.

Table 3.6

Full-Time Workers: Hourly Wages and Training Relatedness

			Relatedness of Training to Current Job					
	Total		Directly Related		Somewhat Related		Not Related	
Vocational School Program	N	Avg. Wage	N	Avg. Wage	N	Avg. Wage	N	Avg. Wage
ALL FULL-TIME WORKERS	856	8.14	350	8.60	37	8.11	269	7.57
Program Studied in Voc/Tech School								
Agriculture	20	7.35	3	7.96	5	8.05	12	6.91
Marketing & Distributive Ed.	13	7.51	4	6.54	6	6.89	3	10.03
Health Occupations	33	7.00	9	7.21	11	6.66	13	7.10
Consumer & Homemaking	11	5.90	2	4.62	5	6.10	4	6.29
Food/Restaurant	44	7.51	21	6.75	10	8.96	13	7.64
Business/Office	48	7.03	12	6.92	25	7.26	11	6.60
Technical	94	7.75	31	8.14	37	7.46	26	7.70
Male			22	8.27	25	7.76	24	7.50
Female			9	7.82	12	6.85	2	10.12
Building Trades	100	9.13	58	9.31	21	9.16	21	8.62
Automobile/Engine	110	8.90	51	9.49	24	8.98	35	7.99
Machine & Metal Trades	117	8.62	58	9.00	31	8.84	28	7.60
Electrical & Appliance	105	8.83	54	9.53	21	8.67	30	7.69
Design-Related	89	7.40	29	7.57	23	7.49	37	7.22
Male			18	7.96	13	8.66	19	8.05
Female			11	6.94	10	5.97	18	6.34
Custom Finishing	43	8.01	9	7.37	13	9.08	21	7.63
Male			9	7.37	13	9.08	13	8.82
Female			0	---	0	---	8	5.69
Other	25	6.65	7	6.68	4	6.64	14	6.64
Economic Region								
Metro Boston	521	8.42	211	8.94	152	8.35	158	7.80
Balance of State	333	7.71	139	8.07	85	7.68	109	7.27

Table 3.7

Current Postsecondary School Programs

ENROLLMENT AT TIME OF SURVEY	241	(20 percent of the sample)

Current Postsecondary Program Category	Number	Percent
AGRICULTURE	(3)	(1.2)
Landscaping	1	0.4
Animal Sciences	2	0.8
MARKETING & DISTRIBUTIVE ED.	(19)	(7.9)
Banking	2	0.8
Marketing	3	1.2
Real Estate	2	0.8
Insurance	1	0.4
Management Training	5	2.1
Line Management	1	0.4
Hotel Management	5	2.1
HEALTH OCCUPATIONS	(7)	(2.9)
Radiology	2	0.8
E.M.T.	1	0.4
Nursing	4	1.7
CONSUMER & HOMEMAKING	(1)	(0.4)
Child Care	1	0.4
FOOD/RESTAURANT	(4)	(1.7)
Food Service	2	0.8
Culinary Arts	2	0.8
BUSINESS/OFFICE	(54)	(22.4)
Para-legal	4	1.7
Business	33	13.7
Accounting	14	5.8
Word Processing	2	0.8
Travel Agent	1	0.4
TECHNICAL	(77)	(32.0)
Engineering	43	17.8
Technician	5	2.1
Electronics	5	2.1
Engineering Management	1	0.4
Computers	18	7.5
Data Processing	2	0.8
M.I.S.	2	0.8
Aviation	1	0.4

(CONTINUED)

Table 3.7
(continued)

Current Postsecondary School Programs

ENROLLMENT AT TIME OF SURVEY 241 (20 percent of the sample)

Current Postsecondary Program Category	Number	Percent
BUILDING TRADES	(19)	(7.9)
Construction	4	1.7
Carpentry	4	1.7
Plumbing/Heating	11	4.6
AUTOMOBILE/ENGINE	(6)	(2.5)
Automobile Mechanic	5	2.1
Truck Driver	1	0.4
MACHINE & METAL TRADES	(3)	(1.2)
Sheet Metal	3	1.2
ELECTRICAL & APPLIANCE	(9)	(3.7)
Electrical	7	2.9
Oil Burners	1	0.4
Industrial Science	1	0.4
DESIGN-RELATED	(11)	(4.5)
Drafting	3	1.2
Architect	2	0.8
Fashion Design/Illustrator	2	0.8
Graphic Design	4	1.7
CUSTOM FINISHING	(0)	(0.0)
OTHER	(2)	(0.8)
Cosmetology	2	0.8
NOT RELATED TO ANY VOCATIONAL OCCUPATION	(26)	(10.8)
Law	4	1.7
Education	5	2.1
Liberal Arts	7	2.9
Human Services/Ministry	3	1.2
Police/Fire	3	1.2
Environmental/Biology	2	0.8
Phys Ed./Recreation	2	0.8

Table 3.8

Relatedness of Training to Current Postsecondary Programs

Vocational Education Program Studied	Number of Respondents Currently Enrolled in a Postsecondary Program	Enrollees in a Program Related to Their Vocational Occupation	
		N	%
ALL PROGRAMS	239	100	41.8
Agriculture	6	2	33.3
Marketing & Distributive Ed.	8	2	25.0
Health Occupations	10	4	40.0
Consumer & Homemaking	5	1	20.0
Food/Restaurant	11	3	27.3
Business/Office	15	9	60.0
Technical	61	41	67.2
Building Trades	18	12	66.7
Automobile/Engine	15	6	40.0
Machine & Metal Trades	21	2	9.5
Electrical & Appliance	30	6	16.7
Design-Related	24	11	45.8
Custom Finishing	9	0	0.0
Other	6	1	16.7

CHAPTER 4

EMPLOYMENT STABILITY AND WAGE GROWTH

The previous chapter provided a "snapshot" of the current labor market and educational status of the graduates. While useful, the results do not create a complete picture of the longer-term prospects for vocational education completers. Some of the lower-wage jobs reported for recent graduates may offer valuable training and job security, the benefits of which will not materialize for many years. On the other hand, today's high-wage jobs in the "blue collar" sector may in some cases provide little room for advancement, flat wage profiles over time, and unstable employment in the face of an economic downturn.

Given the unpredictability of the relationship between present wages and longer term employment prospects over the life cycle, we would ideally have at our disposal longitudinal (multi-year) data on the wage growth and job mobility of vocational graduates. Obviously, however, such data takes years to collect, and does not provide the "quick-turnaround" analysis required by educational policymakers and administrators.

While the student survey reported on here provides mostly cross-sectional data from the Fall of 1986, it does have a longitudinal component as well. Respondents were asked about their school and work activities in the previous year, i.e. in the Fall of 1985. They also provided information concerning their tenure on their current jobs, and the number of full-time jobs that they have held since graduation. Thus from a single survey we can establish proxies of longitudinal outcomes.

From this retrospective information we have constructed a profile of the graduates' wages and job mobility for 1985 and 1986. This chapter reports on the overall wage growth and employment stability of the graduates, as well as on the relationship between these labor market outcomes and the respondents' personal and programmatic characteristics.

As in previous chapters, the discussion will be organized around a series of germane research questions.

QUESTION: **What was the labor force status of the respondents one year prior to the survey (Fall 1985)? How does this compare to their status at the time of the survey?** (Tables 4.1-4.2)

The proportion of respondents in full-time work, part-time work, and school, for the most part, remained unchanged between the Fall of 1985 and the Fall of 1986.

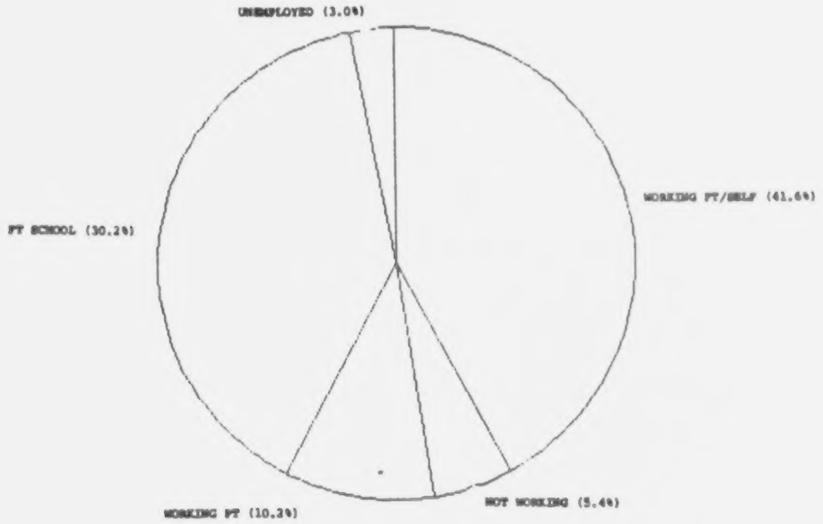
We found that 77 percent of the respondents were working in full-time positions in the Fall of 1985. As was noted in the previous chapter, this is the exact same percentage as reported at the time of the survey. As would be expected, the percentage of graduates attending school and/or working part-time had fallen slightly from one in seven to one in eight. This most likely reflects the passage of time required for the class of 1982-83 to finish a postsecondary program even if they did not start immediately upon graduation.

Those who were employed full-time in 1985 in large part continued to be full-time workers one year later. In addition, many of the graduates who were working part-time or attending school a year ago had made a successful transition to full-time work by the time of the survey.

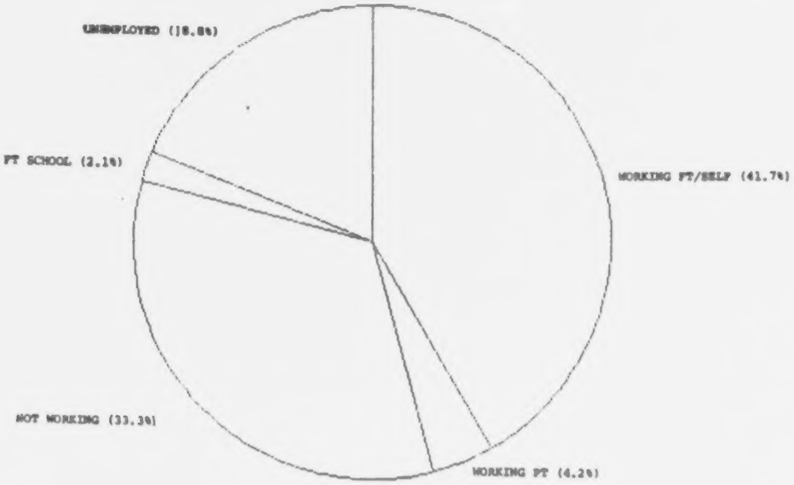
Nearly 90 percent of those who were employed one year ago were still working full-time at the point of the survey. Over the course of this one-year period we also observed that over 40 percent of those who were either working part-time or in school a year ago made the transition to full-time employment by the time of the survey. An additional 40 percent remained in school on a full-time basis.

With respect to the population of graduates who were unemployed or out of the labor force, it was observed that approximately 40 percent moved into full-time employment over the course of the one-year period. Slightly over 18 percent of this group (under 10 respondents) remained unemployed. This again reflects quite a positive labor force profile.

Current Status of Graduates Working Part-Time or In School One Year Ago



Current Status of Graduates Not Working One Year Ago



QUESTION: **How much employment stability is there among vocational education graduates?** (Table 4.3)

The importance of employment stability may be somewhat different for a teenager entering the labor market than for a working adult. It is generally acknowledged that stability of employment is an indicator of labor force success. However, high school graduates tend to "try-out" various employment opportunities before settling into a position which has a longer-term horizon. Given this transitory nature of many young workers, short job tenure and frequent job changes are not necessarily indications of labor market problems. Conversely however, the exhibition of stable work habits at an early age is a positive reflection on vocational education.

Having been exposed to the various aspects of an occupation, the vocational graduate may be in a better position to make an informed decision when embarking on his/her career path. One employer noted that "vocational training made (the graduate) aware of what was involved in the field, and therefore prepared him to make a commitment to a career. Many people have started with us only to find that they preferred another line of work."

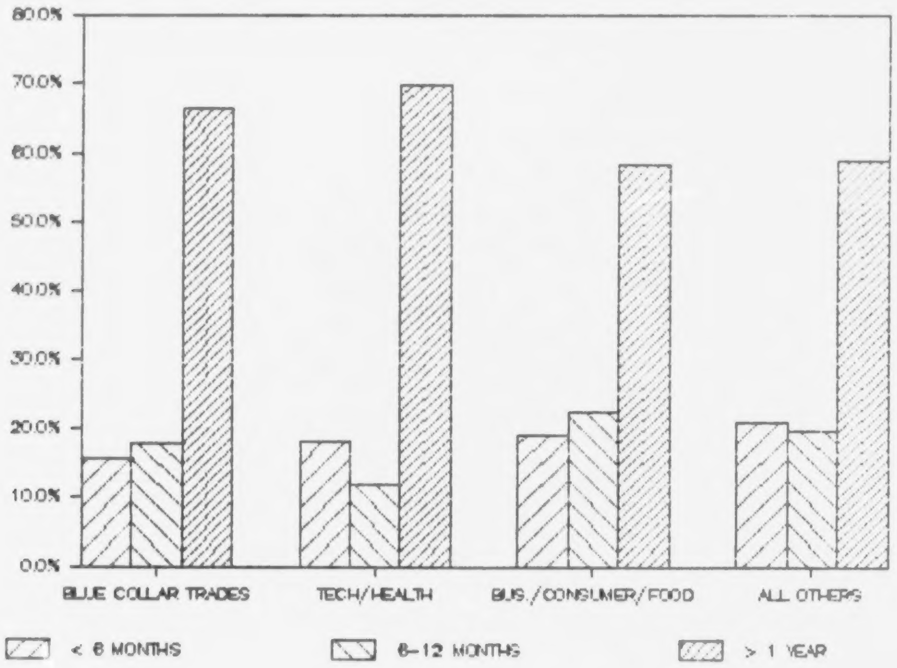
The majority of those employed full-time in both the Fall 1985 and the Fall of 1986 have been on their current job for more than one year.

At the time of the survey, nearly two-thirds (63.9 percent) reported more than one year of job tenure. The remainder of the respondents were evenly split between those who have been on the job between 6 and 12 months and those with less than six months of job tenure. Some differences were noted in the job tenure reported by males and females. The exhibit indicates that approximately 65 percent of the men were on their jobs in excess of twelve months compared to 60 percent of the women. This difference is reflected in an examination of job tenure across the various occupations studied by graduates. The traditional "blue collar" occupations which tend to be male-dominated (building trades, automobile/engine, machine and metal trades, electrical and appliance) for the most part exhibited an above average proportion of graduates employed for more than a year. It is likely that the comparatively high wage potential in these fields serves to minimize the rate of job turnover.

Consistent with the general pattern that was noted earlier, several of the female-dominated fields of study (associated with comparatively lower wage opportunities) produced lower rates of overall job tenure. Specifically, business and office, consumer/homemaking, and food and restaurant all reported below average levels of respondents holding their current job for twelve months or longer.

It should be noted, however, that this general pattern had some exceptions. Particularly noteworthy were graduates in technical occupations and health fields, who demonstrated quite stable levels of job tenure. This may in part reflect the fact that these two occupational areas provide strong employment opportunities in the Massachusetts economy, particularly in the metro-Boston region.

Job Tenure: Full-Time Workers 1985 & 1986



An accompanying indicator which may shed additional light on the concept of employment stability is the total number of jobs held since graduation. This represents a 39-month period for those graduating in the class of 1982-83 and a 27-month period for those in the class of 1983-84. Such a measure must, however, be interpreted with caution. On the one hand, minimal job change over this extended period of time clearly reflects strong attachment to the labor force. On the other hand, numerous job changes may not always reflect restless "job-hopping" or an inability to hold down stable employment. It may in fact indicate a series of positive moves prompted by improved employment opportunity.

> Of those respondents who were employed full-time at the point of the survey and the year before, the majority had at most two jobs since graduating from their vocational education program.

Nearly two-thirds of the respondents in this category had two or fewer jobs since the time of graduation. Not surprisingly, the younger graduates (class of 1983-84) were much more likely to have had only one job than their counterparts in the class of 1982-83 (30.3 percent versus 21.9 percent). At the other end of the spectrum, we note that only 11.4 percent of the respondents held four or more jobs since graduation. This percentage was of course slightly higher for the class of 1982-83 who had an extra twelve months in the labor market to pursue employment.

We should make two additional observations about these data on number of full-time jobs since graduation. First, it appears that a much greater proportion of women reported holding only one or two jobs since graduation compared to their male counterparts (75.6 percent vs. 61.9 percent). Rather than a significantly higher incidence of job stability however, this likely reflects in part the greater incidence of women spending a portion of their post-graduation time out of the labor force.

The data also indicate that the group of respondents who moved more than fifty miles since graduation reported the greatest likelihood of holding four or more jobs. Although this is a comparatively small group, they do appear to exhibit a somewhat greater tendency towards job change.

When examined together, the data on current job tenure and number of jobs held since graduation provide a positive profile of employment stability among vocational education graduates. The overall quality of this employment experience however depends not only on stability but on growth in earnings and the increasing ability to achieve economic self-sufficiency. This will be examined below.

QUESTION: How much wage growth has been experienced by full-time workers over the year prior to the interview? (Table 4.4)

When comparing wages from 1985 with those earned in 1986 for full-time workers, we find that, on average, there has been considerable wage growth over the year.

Almost half of the workers (45.2 percent) received increases of 20 percent or greater and over 70 percent experienced an increase in excess of 10 percent. During a time frame in which overall inflation levels were quite low, this represents solid increases in disposable income.

Although solid wage growth was a nearly universal phenomena among full-time workers, there were some variations among respondent subgroups as well as some actual wage declines that should be noted. With respect to a breakdown by sex, the data reveal that although women have experienced considerable wage growth, the proportion of raises in excess of 20 percent were comparatively fewer than for men (39.4 percent versus 47 percent). With respect to race, the data indicate that nonwhites actually experienced the highest proportion of large wage increases of any subgroup of the respondent population. Specifically, we found that over half (54.3 percent) of the minority graduates reported a wage increase in excess of 20 percent.

Wage increases were also prevalent across the full range of occupations studied. In a few programs, wage increases of 20 percent or more were not as frequent, including design-related and the machine and metal trades. However, even in these programs over three out of five graduates working full-time experienced an hourly wage increase of 10 percent or more. Large wage increases of 20 percent or more were least common among graduates of health programs. Only one out of five of these workers received such a sizeable increase compared to nearly half of the full-time workers overall.

We also noted that the population of graduates who moved 50 miles or more from home reported the highest percentage of wage drops over the one year period. Coupled with the comparatively high number of full-time jobs held since graduation, it appears that the moves may not have been precipitated by the pursuit of a particular job opportunity.

Two additional points should be noted. First it appears that a higher than average percentage (49.1 percent) of the graduates from city/town vocational schools experienced wage gains in excess of 20 percent. This compares to a 41.3 percent and 45.6 percent for the comprehensive and regional vocational/technical schools respectively. This is consistent with findings reported in the previous chapter which indicated that graduates of city/town vocational schools were earning slightly higher hourly wages.

Finally, the data reveal that students in both metro-Boston and the balance of Massachusetts experienced an identical percentage wage change over the one-year period (25 percent). This is of note since in the previous chapter we reported that there was a $0.70 per hour difference in the average wage earned by these two groups of graduates. Despite the wage differential which favors metro-Boston students, it appears that graduates in both economic regions experienced similar patterns of wage mobility reflective of a growing economy, solid job preparation, and good job performance.

QUESTION: **Are workers able to move out of low-wage jobs over time?** (Tables 4.5 and 4.6)

In examining the issue of occupational mobility we are particularly interested in potential improvements in economic self-sufficiency. As such, this portion of our wage analysis will concentrate on the experience of "low-wage" workers and the changes in their wage status over the one-year period leading up to the follow-up survey. To systematically examine this issue, jobs have been divided into three categories: high-wage (more than $8.00 per hour), medium-wage (between $6.00 and $8.00 per hour) and low-wage (less than $6.00 per hour).

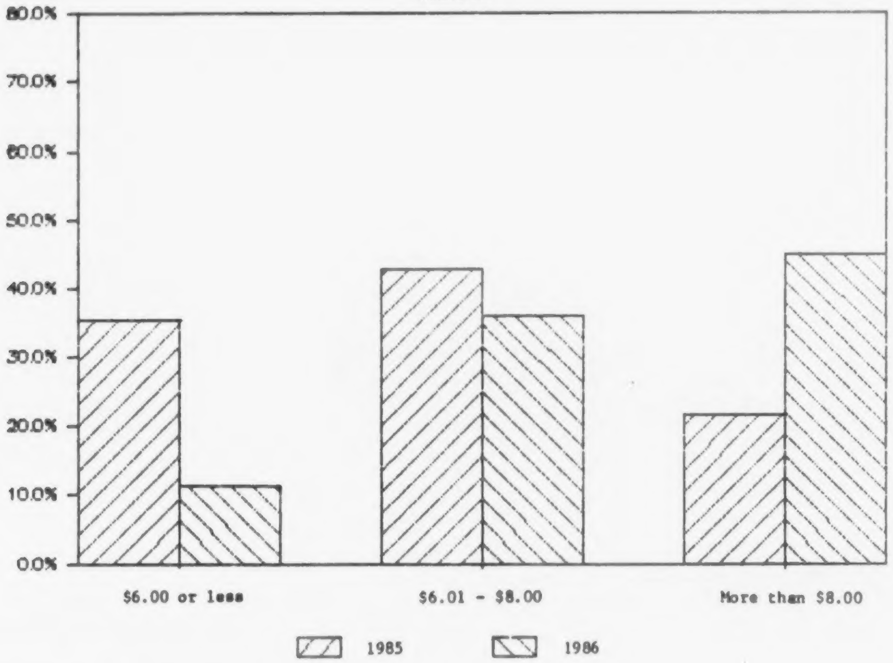
Focusing on those graduates who were full-time workers in both the Fall of 1985 and 1986, we found the following wage distribution at the two points in time.

The following analysis examines movement between these wage categories over the one-year time period. The experience of 1983 and 1984 graduates will be examined separately since expected wage changes are clearly influenced by the amount of experience accrued in the labor force.

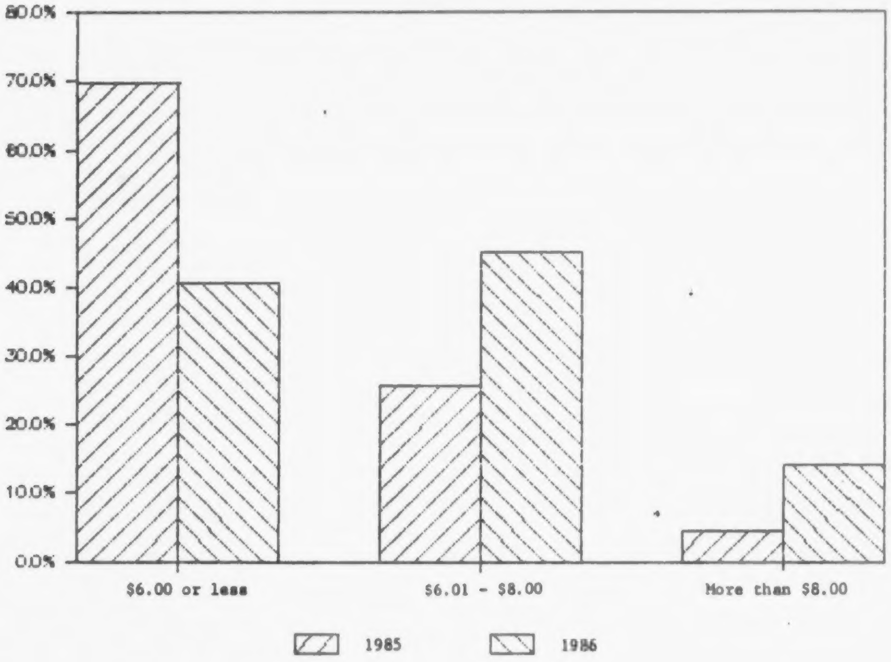
There was substantial movement across wage categories between 1985 and 1986.

Over one in five full-time workers from the class of 1983 were earning over $8.00 at both points in time. However, we also observe that an additional 43 percent experienced positive (upward) movement across the wage categories. Specifically, 20 percent moved from low to medium, 19 percent from medium to high and 4 percent even moved from the low wage category to the high wage category.

Hourly Wages of Full-Time Workers in 1985 & 1986



Males



Females

The class of 1984 also experienced substantial movement. Not surprisingly, a somewhat smaller proportion of respondents in the 1984 class (13 percent versus 20 percent in the class of 1983) reported earning over $8.00 per hour at both points in time. However, nearly half (49 percent) experienced upward movement across the wage categories. In particular, we noted that 20 percent moved from low to medium, 20 percent from medium to high, and a full 9 percent reported movement from the low-wage category to the high-wage category.

> Despite this positive wage mobility, more than one out of every six full-time workers were earning less than $6.00 per hour both one year before the survey and at the time the interview was conducted.

Both the class of 1983 (16 percent) and 1984 (18 percent) contain a core of respondents who reported persistent low wages at both ends of the one-year time frame. It appears that women were particularly vulnerable to enduring low wages, with approximately 40 percent of female respondents reporting wages below $6.00 at both points in time. This compares to only 9.2 percent of the male population who reported a similar wage profile.

QUESTION: **Does overall employment stability appear to be associated with improved wage status?** (Table 4.5 and 4.6)

> Increased tenure on the job was associated with comparatively high wages.

Approximately one half of the 1983 graduates with more than one year of job tenure were earning in excess of $8.00 per hour by the time the follow-up survey was administered. In comparison, only 28 percent of those with less than six months of tenure were earning at this wage level. A similar pattern was exhibited for the graduates of the class of 1984. Although these differences are sizeable, it is unclear whether extended job tenure is generating higher wages or alternatively whether graduates simply hold on to the high wage jobs longer than to other jobs.

In light of this concern we pursued this analysis to examine the wage status of those respondents exhibiting comparatively low levels of job tenure and employment stability. Consistent with the above finding, there is evidence to suggest that those reporting relatively low levels of employment stability exhibited a greater tendency towards persisting low wages. Specifically, we observed that nearly one quarter (23.9 percent) of the class of 1983 respondents who had been on their current job for less than six months had remained in the low wage category over the one year period. Similarly, 20 percent of those who held four or more jobs since graduation experienced the same persistent low wages. This compares to the above-noted 16 percent reported for all full-time workers from the class of 1983.

As a final piece of evidence, we should note that both those with less than six months of job tenure and those who held in excess of four jobs had comparatively high proportions of wage declines over the year leading up to the survey. This was the case for a full 6 percent of the graduates who had only been at their current job for less than half a year.

Summary

In this chapter we examined the employment and wage profile of the graduates over the one-year period immediately preceeding the follow-up survey. In general, we observed a positive trend towards stable employment and improving wage status. First, we noted that the vast majority of those who were employed one year prior to the survey were still employed at the time of follow-up. Many who were in school or working part-time twelve months earlier had made a successful transition to employment by the time of the survey.

Performance indicators that measured over time also suggested a solid degree of employment stability among graduates as a whole. Over two-thirds of the respondents reported that they had been on their current job in excess of twelve months. Comparatively long job tenure was particularly characteristic of those who prepared for traditional "blue collar" occupations.

Over this one-year time span, we also noted considerable wage growth. Nearly half the graduates reported wage increases in excess of 20 percent over this period. Although women participated in this general upward movement, comparatively few experienced the large gains noted above. In spite of the overall improvement in wage conditions over the one year period, there remained a solid 16 to 18 percent of the employed population who continued to earn comparatively low wages (less than $6.00 per hour) over the entire year. Women were disproportionately represented among this group. Finally, this chapter noted that increased levels of employment stability (as indicated by longer job tenure and fewer job changes) appear to be associated with increased hourly earnings.

Table 4.1

Status One Year Before Survey (Fall, 1985)*
(Row Percentages are Shown)

	Status in Fall, 1985					
	Full-Time Work	Part-Time Work	Self-Employed	Full-Time Student	Military	Not Working/ Unemployed
ALL RESPONDENTS	77.4%	9.3%	2.4%	4.5%	2.4%	4.0%
Sex						
Male	80.8	7.4	2.9	4.3	2.9	1.7
Female	68.9	14.2	1.2	4.9	1.2	9.6
Race						
White	77.8	9.2	2.3	4.3	2.5	4.0
Nonwhite	70.6	11.8	4.4	7.4	1.5	4.4
Moved > 50 Miles Since Graduation						
Yes	59.5	6.3	0.0	11.4	19.0	3.8
No	78.8	9.5	2.6	3.8	1.2	4.0
Year of Graduation						
1982-83	78.0	7.6	3.2	3.7	3.4	4.2
1983-84	77.2	11.0	1.4	5.3	1.4	3.7
Type of Vocational School						
Regional Voc/Tech	77.9	8.5	2.6	5.1	2.2	3.7
City/Town Voc/Tech	82.3	6.3	2.3	1.7	1.7	5.7
Comprehensive	73.7	13.2	2.0	4.3	3.3	3.6
Economic Region						
Metro Boston	76.9	9.4	2.6	5.2	2.0	3.9
Balance of State	78.4	9.3	2.2	3.0	3.0	4.1

*Note: These categories are not strictly comparable to these in Table 3.1. Here, it is impossible to distinguish between these full-time students who are working/not working, or those workers who are/are not full-time students.

Table 4.2

Mobility, 1985-1986
(Row Percentages are Shown)

Major Activity One Year Ago (Fall 1985)	N	Major Activity at the Time of the Survey					
		Full-Time Work or Self-Employed	Part-Time Work	Full-Time School	Military	Unem-ployed	Not Working
Full-time Work or Self-Employed	964	89.5	2.1	2.8	0.3	2.8	2.5
Part-time Work and/or Full-Time School	166	41.6	10.2	39.2	0.6	3.0	5.4
Military	28	46.4	0.0	10.7	28.5	7.2	7.2
Not Working/ Unemployed	48	41.7	4.2	2.1	0.0	18.8	33.3

Table 4.3

Full-Time Workers in 1985 and 1986 Job Tenure and Job Mobility

(Row Percentages are Shown)

		Tenure on Current Job			Number of Full-time Jobs Since Graduation			
	N	Less than 6 Months	6-12 Months	More than One Year	1	2	3	4 or More
ALL FULL-TIME WORKERS	814	17.6	18.4	63.9	30.0	35.2	23.1	11.4
Sex								
Male	618	16.8	18.0	65.0	30.4	31.5	25.2	12.6
Female	196	19.9	19.9	60.2	28.9	46.7	16.8	7.6
Race								
White	773	17.2	18.6	64.2	30.2	34.7	23.6	11.4
Nonwhite	38	26.3	13.2	60.5	29.0	44.7	15.8	10.5
Moved > 50 Miles Since Graduation								
Yes	32	18.8	15.6	65.6	21.9	37.5	18.8	21.9
No	780	17.6	18.6	63.8	30.3	35.2	23.4	11.0
Year of Graduation								
1982-83	424	17.0	17.0	65.8	28.2	31.8	24.2	15.5
1983-84	379	18.2	20.0	61.7	31.8	39.7	21.3	6.8
Type of Vocational School								
Regional Voc/Tech	486	18.3	17.5	64.0	29.6	35.3	22.2	12.7
City/Town Voc/Tech	127	17.3	17.3	65.4	31.5	37.0	23.6	7.9
Comprehensive	200	16.0	21.5	62.5	29.9	33.8	25.4	10.4
Program Studied in Voc/Tech School								
Agriculture	18	27.8	16.7	55.6	11.1	33.3	38.9	16.7
Marketing & Distributive Ed.	13	7.7	7.7	84.6	45.2	23.1	23.1	7.7
Health Occupations	27	18.5	18.5	63.0	39.3	32.1	17.9	10.7
Consumer & Homemaking	9	22.2	22.2	55.6	33.3	55.6	11.1	0.0
Food/Restaurant	44	22.7	20.4	56.8	20.4	43.2	22.7	13.6
Business/Office	44	20.4	25.0	54.6	29.6	43.2	18.2	9.1
Technical	83	18.1	12.0	69.9	37.4	33.7	16.9	12.0
Building Trades	99	14.1	20.2	65.7	28.3	32.3	24.2	15.2
Automobile/Engine	108	14.8	19.4	64.8	27.8	29.6	27.8	13.9
Machine & Metal Trades	111	18.0	14.4	67.6	29.7	31.5	29.7	8.1
Electrical & Appliance	105	15.2	18.1	66.7	34.3	32.4	21.0	12.4
Design-Related	87	17.2	19.5	63.2	34.1	40.9	19.3	5.7
Custom Finishing	37	24.3	21.6	54.0	29.7	29.7	24.3	16.2
Other	27	22.2	29.6	48.2	59.3	59.3	22.2	11.1
Economic Region								
Metro Boston	502	18.0	20.0	61.9	28.5	36.4	25.3	9.4
Balance of State	313	17.0	16.0	67.0	32.3	33.2	19.8	14.7

Table 4.4

Full-Time Workers in 1985 and 1986: Percent Wage Change

(Row Percentages are Shown)

	Percent Change in Hourly Wage 1985-1986						
	N	Average Percent Change	>10% Decrease	0-10% Decrease	Increase of 10% or Less	Increase of 10-20%	>20% Increase
ALL FULL-TIME WORKERS	741	24.75	3.1	11.3	14.2	26.2	45.2
Sex							
Male	566	25.80	3.2	12.2	13.2	24.4	47.0
Female	175	21.36	2.9	8.6	17.1	32.0	39.4
Race							
White	704	24.72	3.0	11.8	14.2	26.1	44.9
Nonwhite	35	26.35	5.7	0.0	14.3	25.7	54.3
Moved > 50 Miles Since Graduation							
Yes	30	15.96	10.0	13.3	6.7	36.7	33.3
No	711	25.12	2.8	11.2	14.5	25.7	45.7
Year of Graduation							
1982-83	384	23.05	2.9	12.8	15.6	24.2	44.5
1983-84	346	26.65	3.5	9.8	12.7	27.8	46.2
Type of Vocational School							
Regional Voc/Tech	447	25.49	3.6	9.8	13.9	27.1	45.6
City/Town Voc/Tech	114	25.84	1.8	12.3	15.8	21.0	49.1
Comprehensive	179	22.16	2.8	14.5	14.0	27.4	41.3
Program Studied in Voc/Tech School							
Agriculture	17	12.84	5.9	23.5	23.5	11.8	35.3
Marketing & Distributive Ed.	11	33.33	0.0	0.0	27.3	27.3	45.4
Health Occupation	25	19.88	4.0	0.0	24.0	48.0	24.0
Consumer & Homemaking	9	25.41	11.1	0.0	0.0	22.2	66.7
Food/Restaurant	40	31.82	2.5	7.5	7.5	22.5	60.0
Business/Office	40	20.83	2.5	7.5	15.0	35.0	40.0
Technical	76	21.02	4.0	6.6	15.8	30.3	43.4
Building Trades	88	29.44	3.4	15.9	9.1	14.8	56.8
Automobile/Engine	101	25.09	5.9	9.9	9.9	28.7	45.5
Machine & Metal Trades	100	19.74	3.0	9.0	24.0	28.0	36.0
Electrical & Appliance	97	31.59	0.0	12.4	8.2	23.7	55.7
Design-Related	78	21.78	1.3	15.4	23.1	25.6	34.6
Custom Finishing	35	26.98	5.7	14.3	2.9	28.6	48.6
Other	22	22.48	0.0	27.3	9.1	27.3	36.4
Tenure on Current Job							
<6 months	133	24.51	8.3	14.3	14.3	19.6	43.6
6-12 months	133	26.61	8.3	14.3	9.8	19.6	48.1
More than one year	471	24.39	0.2	9.8	15.3	29.5	45.2
Number of Full-Time Jobs Since Graduation							
One	223	24.14	0.4	10.3	15.7	27.4	46.2
Two	258	23.81	4.3	8.9	12.8	30.2	43.8
Three	169	26.03	3.6	14.8	16.6	19.5	45.6
4 or more	88	25.90	5.7	14.8	10.2	22.7	46.6
Economic Region							
Metro Boston	451	24.70	2.7	11.5	12.9	28.4	44.6
Balance of State	289	24.80	3.8	11.1	16.3	22.8	46.0

Table 4.5

Full-Time Workers, Class of 1983
Movement Across Wage Categories* from 1985 to 1986

	N	Low to Low	Low to Medium	Low to High	Medium to Medium	Medium to High	High to High	Decline Into Lower Category
ALL FULL-TIME WORKERS Class of 1983	384	15.9	19.5	4.4	18.2	19.3	21.4	1.3
Sex								
Male	294	9.2	15.6	5.8	19.7	21.8	26.2	1.7
Female	90	37.8	32.2	0.0	13.3	11.1	5.6	0.0
Race								
White	365	15.6	19.2	4.7	18.9	18.9	21.4	1.4
Nonwhite	18	22.2	27.8	0.0	5.6	22.2	22.2	0.0
Moved > 50 Miles Since Graduation								
Yes	17	23.5	17.6	0.0	5.9	23.5	29.4	0.0
No	367	15.5	19.6	4.6	18.8	19.1	21.0	1.5
Type of Vocational School								
Regional Voc/Tech	230	16.5	19.1	4.8	15.2	22.6	21.3	0.4
City/Town Voc/Tech	65	16.9	21.5	6.2	16.9	12.3	24.6	1.5
Comprehensive	89	13.5	19.1	2.2	27.0	15.7	19.1	3.4
Program Studied in Voc/Tech School								
Agriculture	8	37.5	0.0	0.0	12.5	37.5	12.5	0.0
Marketing & Distributive Ed.	5	20.0	20.0	20.0	20.0	0.0	20.0	0.0
Health Occupations	12	41.7	16.7	8.3	16.7	0.0	16.7	0.0
Consumer & Homemaking	6	83.3	0.0	0.0	16.7	0.0	0.0	0.0
Food/Restaurant	24	25.0	33.3	4.2	4.2	12.5	20.8	0.0
Business/Office	24	29.2	29.2	0.0	20.8	12.5	8.3	0.0
Technical	43	11.6	23.3	0.0	27.9	30.2	7.0	0.0
Building Trades	48	8.3	16.7	14.6	20.8	14.6	25.0	0.0
Automobile/Engine	45	4.4	22.2	2.2	6.7	20.0	35.6	8.9
Machine & Metal	50	14.0	10.0	0.0	10.0	30.0	34.0	2.0
Electrical & Appliance	45	2.2	13.3	6.7	26.7	31.1	20.0	0.0
Design-Related	45	22.2	26.7	0.0	24.4	8.9	17.8	0.0
Custom Finishing	19	21.0	10.5	15.8	21.0	5.3	26.3	0.0
Other	10	10.0	40.0	0.0	20.0	20.0	10.0	0.0
Tenure on Current Job								
<6 Months	67	23.9	25.4	4.5	16.4	9.0	14.9	6.0
6-12 Months	67	14.9	22.4	10.4	17.9	13.4	19.4	1.5
>One Year	248	14.1	17.3	2.8	19.0	23.8	23.0	0.0
Number of Full-Time Jobs Since Graduation								
One	108	19.4	15.7	2.8	20.4	20.4	21.3	0.0
Two	119	11.8	21.0	5.0	16.0	20.2	24.4	1.7
Three	91	14.3	18.7	5.5	20.9	18.7	20.9	1.1
4 or More	65	20.0	23.1	4.6	15.4	16.9	16.9	3.1
Economic Region								
Metro Boston	239	11.3	17.6	4.2	20.9	20.1	24.7	1.2
Balance of State	145	23.4	22.8	4.8	13.8	17.9	15.9	1.4

*Wage Categories: Low-Wage: $6 or less; Medium-Wage: $6.01-$8.00; High-Wage: More than $8.00.

Table 4.6

Full-Time Workers, Class of 1984
Movement Across Wage Categories* from 1985 to 1986

	N	Low to Low	Low to Medium	Low to High	Medium to Medium	Medium to High	High to High	Decline Into Lower Category
ALL FULL-TIME WORKERS Class of 1984	346	18.5	19.9	9.2	18.2	19.6	13.3	1.2
Sex								
Male	265	11.3	18.5	11.3	17.7	23.8	16.6	0.8
Female	81	42.0	24.7	2.5	19.8	6.2	2.5	2.5
Race								
White	328	18.3	19.8	9.4	18.3	19.5	13.4	1.2
Nonwhite	17	17.6	23.5	5.9	17.6	23.5	11.8	0.0
Moved > 50 Miles Since Graduation								
Yes	13	30.8	23.1	0.0	23.1	15.4	0.0	7.7
No	333	18.0	19.8	9.6	18.0	19.8	13.8	0.9
Type of Vocational School								
Regional Voc/Tech	259	18.9	22.6	9.2	17.5	20.7	9.2	1.8
City/Town Voc/Tech	62	20.4	10.2	10.2	14.3	18.4	26.5	0.0
Comprehensive	112	15.2	19.0	8.9	22.8	17.7	16.5	0.0
Program Studied in Voc/Tech School								
Agriculture	9	33.3	11.1	0.0	11.1	22.2	22.2	0.0
Marketing & Distributive Ed.	6	16.7	50.0	0.0	16.7	16.7	0.0	0.0
Health Occupations	11	27.3	27.3	9.1	36.4	0.0	0.0	0.0
Consumer & Homemaking	3	33.3	66.7	0.0	0.0	0.0	0.0	0.0
Food/Restaurant	15	46.7	13.3	13.3	13.3	6.7	6.7	0.0
Business/Office	15	33.3	26.7	0.0	26.7	13.3	0.0	0.0
Technical	33	21.2	21.2	3.0	21.2	18.2	15.2	0.0
Building Trades	40	5.0	10.0	10.0	15.0	32.5	27.5	0.0
Automobile/Engine	52	11.5	15.4	17.3	9.6	26.9	15.4	3.8
Machine & Metal	50	11.0	16.0	8.0	30.0	18.0	18.0	0.0
Electrical & Appliance	49	14.3	26.5	12.2	12.2	22.4	12.2	0.0
Design-Related	33	24.2	21.2	12.1	21.2	9.1	9.1	3.0
Custom Finishing	16	18.8	25.0	6.2	12.5	25.0	6.2	6.2
Other	12				16.7	8.3	0.0	
Tenure on Current Job								
<6 Months	64	20.3	21.9	12.5	20.3	9.4	14.1	1.6
6-12 Months	64	23.4	20.3	10.9	21.9	15.6	4.7	3.1
>One Year	216	16.7	19.4	7.9	15.7	24.1	15.7	0.5
Number of Full-Time Jobs Since Graduation								
One	111	13.5	21.6	5.4	16.2	25.2	17.1	0.9
Two	138	22.5	20.3	10.9	18.8	15.9	10.9	0.7
Three	73	16.4	15.1	9.6	21.9	20.6	13.7	2.7
4 or More	22	27.3	22.7	18.2	9.1	13.6	9.1	0.0
Economic Region								
Metro Boston	201	13.4	19.4	9.4	22.4	20.4	14.9	0.0
Balance of State	144	25.0	20.8	9.0	12.5	18.8	11.1	2.8

*Wage Categories: Low-Wage: $6 or less; Medium-Wage: $6.01-$8.00; High-Wage: More than $8.00.

CHAPTER 5

VOCATIONAL EDUCATION AND WORK QUALITY: GRADUATES' PERCEPTIONS

The student survey was designed to assess the graduates' satisfaction with both their vocational education and their current job performance. In this chapter we hear directly from the graduates concerning the instructional quality and adequacy of specific academic and technical components of their education. Also, we examine links between the perceived quality of vocational programs and subsequent self-ratings of performance on the job.

At the time of the survey, the graduates were two to three years beyond high school, depending on their graduation class. As we saw in Chapter 3, most had become active, full-time participants in the labor force. As such, the survey respondents were in a good position to assess their vocational education experience. As workers, they now have a sense of the skills needed to be successful in their chosen field. Also, by now they have fairly strong opinions as to whether their training provided them with these job skills.

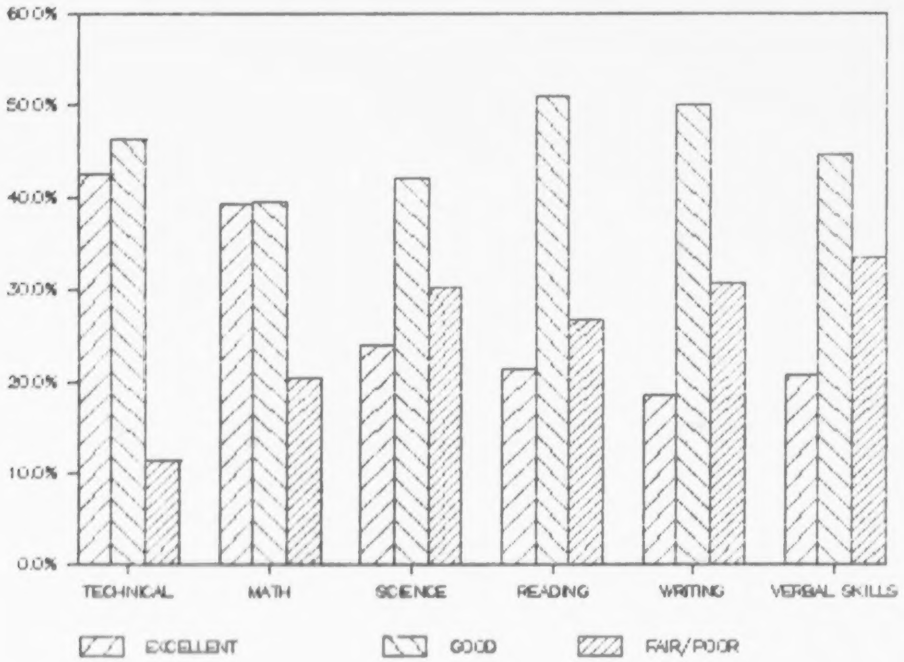
This chapter begins by reporting on the graduates' perceptions of the quality of academic and technical preparation as well as job placement support provided by their vocational program. In addition, respondents' assessment of their current job performance is presented. Finally, we review linkages between student assessments of the educational components and their evaluation of subsequent job performance.

QUESTION: How did graduates rate the quality of the academic and technical components of their vocational education? (Table 5.1)

The graduates were asked to rate their vocational education programs on a four-point scale (excellent, good, fair, poor), where (1) is excellent and (4) is poor. The respondents rated specific components of their academic training (e.g. reading and math), and provided an overall rating of the quality of their technical programs.

> On average, the quality of math and technical training was rated much higher than other traditional academic areas such as reading, writing, science, and verbal skills.

Graduate Evaluation of Educational Components



As is evident in the above graph, almost all of the respondents rated their technical training as excellent (42 percent) or good (46 percent). Similarly, four out of five graduates gave their math education a favorable rating. Other academic subjects, on the other hand, were not perceived quite as favorably. Slightly over 70 percent of the graduates rated reading preparation as excellent or good, while less than 70 percent gave this rating for writing and science. One out of every three respondents rated their education in verbal skills as fair or poor.

The importance of their positive perceptions of technical training cannot be overemphasized in light of the considerable investment the vocational education system has made in technical instruction and equipment. Additionally, the fact that vocational students generally tend to be more technically and quantitatively inclined undoubtedly contributed to their positive ranking of these subjects. As a result, the positive perceptions may partially reflect the simple meshing of interests and vocational education offerings.

Conversely, having opted for vocational education, which stresses the technical, the relatively low assessment of academic components may again be a reflection of inherent interests and aptitudes. It is also possible however that these perceptions are borne out of current labor market experiences. As graduates reflect back on their vocational education, they may wish that they had paid more attention to their academic skills. They may regret the attitude expressed by a former business student about his vocational education days: "For me, school was school. I could not care less." The graduates' experience in the labor market may have convinced them of the critical importance of reading and writing skills within almost all jobs. In the words of one electronics and construction graduate, "If I had applied myself, I could be wearing a suit and tie..." Thus persistent troubles in these areas may lead to fairly critical assessments of the quality of previous academic programs, even if the difficulties are not wholly attributable to the quality of the education itself.

Similarly graduates who chose to pursue a higher education and were somewhat retrospectively critical of their academic preparation may also have been just regretting the amount of effort they put into acquiring the basic academic skills. One electronics graduate advised, "You should crack down on the students, tell them education means a lot in the future, show them that if you work for a company, 35 years down the road, someone younger with more education will take your job."

A related topic which was not asked about in the survey but which several graduates mentioned in their comments was the limited nature of the academic courses available to vocational students. Several graduates felt their own personal development as well as their ability to perform on a college level had been hindered by an academic curriculum designed for the stereotypical non-academic vocational student. A former automotive student, for example, "was discouraged in (his) academic classes from pursuing an interest in creative writing. You get the impression that if you choose automotive, other academic pursuits are closed to you." Another graduate felt she was "deprived of learning languages, literature, etc. that would have helped in college. (They) should have offered courses/electives that are tougher, more like college prep courses....also, they should make these courses available to everyone and not just a selected number of "smart" students."

Although it is the generally recognized purpose of vocational schools to prepare students for employment, graduates appear to see a need retrospectively for a greater emphasis on college as an option. A health assistant graduate summed it up: "I think they should push college more. Most people have the idea that they want to learn a trade, but then they change their minds. Need language courses for college. (Voc schools) should have more college-oriented programs. Most people I know don't want to send their kids to vocational school because they want them to go to college."

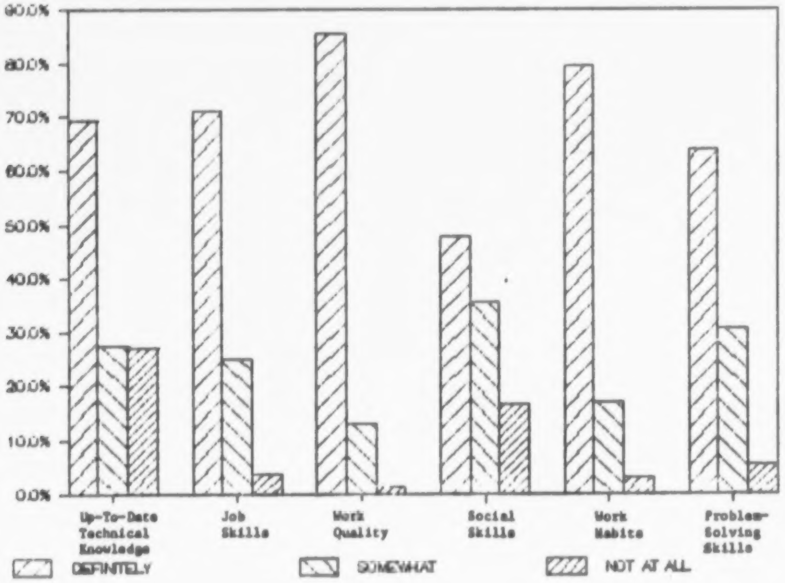
QUESTION: How did the graduates rate vocational shop instructors and job preparation/placement efforts? (Table 5.2)

The survey included a variety of questions on the performance of shop instructors, including their technical knowledge and ability to teach job related skills. Instructors' ability to perform well was scored as (1) "definitely," (2) "somewhat," and (3) "not at all." Using this three-point scale, respondents gauged the overall ability of vocational education to prepare students for work and to help in the job placement effort.

> The vast majority of the graduates reported that their instructors cared about work quality and taught good work habits. Over one in four, however, believed that instructors may not have had completely up-to-date technical knowledge, and only "somewhat" taught the skills needed on a job.

The strength of vocational education instruction, as perceived by the graduates themselves, is in developing conscientious work habits while emphasizing quality. While most instructors had up-to-date technical knowledge and taught job-relevant skills, about one in four graduates considered this somewhat of a weakness in their program. Finally, the results indicate that only about half to two-thirds of the graduates believed that problem solving and social skills were effectively taught by shop instructors. Interestingly, several students commented on the instructors' need to put more into their teaching and suggested a common solution. "They (shop instructors) should be paid more so that they would take interest in the students' well being." "I believe they should increase the budget: there were a lot of things we didn't have money for--stock and tools. Give the teachers a raise so they put their all into it!"

Graduate Evaluation of Shop Instructors



The above chart provides detail on these general findings. Notice that four out of five respondents said that their instructors "definitely" taught good work habits. Even more (86 percent) reported that the quality of workmanship was emphasized in their shop classes.

Virtually none of the graduates believed that their instructors were completely lacking in up-to-date technical knowledge or job-relevant instruction. However, 28 percent thought that instructors were only "somewhat" up-to-date in their knowledge, and 25 percent thought that the instruction was only "somewhat" job relevant.

Problem-solving skills were "definitely" taught in over three out of five cases, according to the graduates. The rest believed that problem solving was taught "somewhat" (30 percent) or "not at all" (6 percent). Most of the respondents (52 percent) indicated that social skills instruction was not heavily emphasized by their shop teachers.

While most graduates believed that vocational education definitely prepares students for work, many thought that the teachers and staff were not very helpful in the job placement effort.

Almost three out of five graduates reported that the school was "definitely" helpful in securing a job after graduation. "If they had done any more, the job would have been theirs, not mine...," a graduate noted. In many cases though, the teachers and staff were either "not at all" helpful (19 percent) or only "somewhat" helpful (23 percent). But, in the opinion of one carpentry graduate, "Their job is to teach you the skills; getting the job is up to you."

	Definitely	Somewhat	Not at All
Vocational education prepares students for work	53.7%	42.7%	3.6%
Teachers/Staff helpful in job placement	57.5%	23.1%	19.3%

The job placement findings above should be interpreted rather cautiously. Among those 19 percent who said that the school was "not at all" helpful in the job placement effort, some may have been continuing on to further schooling. If so, these graduates would have had little need for job placement efforts.

One factor which appeared to influence the graduates' perceptions of their schools' assistance in the placement process was the existence of a co-op program. Although not questioned directly about this, many graduates commented spontaneously on how the experience gained in a co-op job provided them with an edge in their field. Often, it seemed, the co-op job became a permanent position after graduation. Without statistical evidence available to support what the comments of both graduates and employers imply about the importance of co-op experience, we can only present the comments themselves for the reader's own assessment.

> "The most valuable asset the high school offered to the students, in my opinion, is the cooperative education program. It gives the students the opportunity to apply their studies and skills to real-life hands-on training." -Data Management graduate

> "Co-op programs and academics go together in preparing students for work..." -Autobody graduate

> "The students I think should get more on the job training to be able to know what it's like in the real world. Working for a teacher and working for a contractor are two different things." -Carpentry graduate

> "High schools should involve themselves more with juniors and seniors to make them understand the world outside...perhaps a work-study program." -Business graduate

> "In shop we learned related things. Co-op job taught me what was going on out in the field." -HVAC graduate

The employers also held co-op experience in positive regard as the following comments indicate.

> "Vocational high school gives these kids a head start in the knowledge and skills needed in their apprenticeship...Especially those in the work-study program."

> "It (the co-op program) allows the student to receive actual experience with which he/she can then return to school and be more familiar with how the book knowledge is actually used."

QUESTION: What rating did graduates give themselves on their current jobs? (Table 5.2)

The respondents were asked to evaluate their performance on their current or most recent job. As might be expected, the graduates exhibited a great deal of self-confidence. However, there was some variation in the self-evaluations in the areas of technical ability and enjoyment of work.

> Over nine out of ten respondents believed that their boss was "definitely" satisfied with their work quality. Virtually all of the respondents reported that they get along with their co-workers and have good work habits.

Graduates' Self-evaluations of Job Performance

	Definitely	Somewhat	Not at All
Boss satisfied with work quality	90.9%	8.4%	0.3%
Get along with co-workers	93.7%	6.1%	0.1%
Have good work habits	93.7%	6.1%	0.1%
Possess the necessary technical skills	84.4%	12.8%	2.8%
Enjoy working	83.3%	14.6%	2.1%

As can also be seen in the table above, slightly fewer workers (84.4 percent) believed that they "definitely" possess the necessary technical skills to do their job. This is consistent with the previous findings in which the students gave higher ratings to the instructors' teaching of work quality and work habits rather than up-to-date technical skills. In fact, one automotive graduate informed us, "In the real world you work much faster while in school they taught you to work slower and more thoroughly." Finally, it should be noted that the vast majority of respondents reported that they enjoy working.

QUESTION: **Do the graduates' perceptions of vocational education program components (academic and technical) and current job performance vary according to personal and programmatic characteristics?** (Table 5.3-Table 5.5)

As discussed above, graduates ranked vocational program components (academic and technical) and their current job performance along three and four-point scales. In order to facilitate comparisons across personal and programmatic characteristics, averages were taken of the individual rankings. Please note that a lower average score represents a more positive rating than a higher average score.

Female students generally rated both academic and technical offerings more positively than did their male counterparts.

Graduates' Ratings of Educational Components

Vocational Offering	Average Rating (1=Excellent, 4=Poor) Males	Females
Overall Academic	2.13	2.01
Reading	2.16	1.94
Writing	2.25	1.99
Science	2.16	2.08
Verbal Skills	2.25	2.11
Math	1.83	1.94
Technical Programs	1.73	1.63

As is evident from the table above, all academic components were rated more positively by females, with the exception of math education (1.94 for females versus 1.83 for males). Technical programs were almost universally praised, especially by female students.

Perceptions of instructional quality varied by sex, program studied and type of school attended.

While the overall rating of instructors was virtually the same for females and males (1.35 versus 1.36), there was variation across the specific components of instructional quality. Females were more likely than males to believe that instructors taught social skills (1.57 versus 1.74). Males, however, were more apt to report that problem-solving skills were taught well (1.38 versus 1.50).

Some of these differences may have more to do with the content of occupational programs than the sex of the students per se. For example, electrical and appliance instructors emphasized problem-solving skills (1.26). In the health and food service fields, the problem-solving average was in the 1.4 to 1.6 range. In the building trades, students report an overwhelming degree of attention paid by instructors to work quality (1.07).

Graduates of regional vocational/technical schools tended to give the highest ratings to both academic and technical training, as well as to the overall preparation received for work. Comprehensive high schools received the lowest ratings for technical training. Curiously however, graduates from comprehensive schools did not give the highest rankings in academic preparation.

Those training for "blue collar" trades were most likely to find vocational schools helpful in their job search effort.

As shown in the table below, graduates from all traditional "blue collar" occupations (with the exception of automobile/engine) reported better than average levels of job search assistance from their instructors and school staff. In contrast, only half of those studying technical fields believed that vocational schools were "definitely" helpful in the placement effort.

School Staff Helpful in Job Placement?

	Definitely	Somewhat	Not at All
All Respondents	60.2%	19.7%	20.0%
Building Trades, Machine & Metal, Electrical & Appliance	63.8%	22.0%	14.3%
Automobile/Engine	56.7%	17.0%	26.2%
Technical Occupations	50.3%	27.3%	22.4%
All other occupations	61.2%	16.1%	22.7%

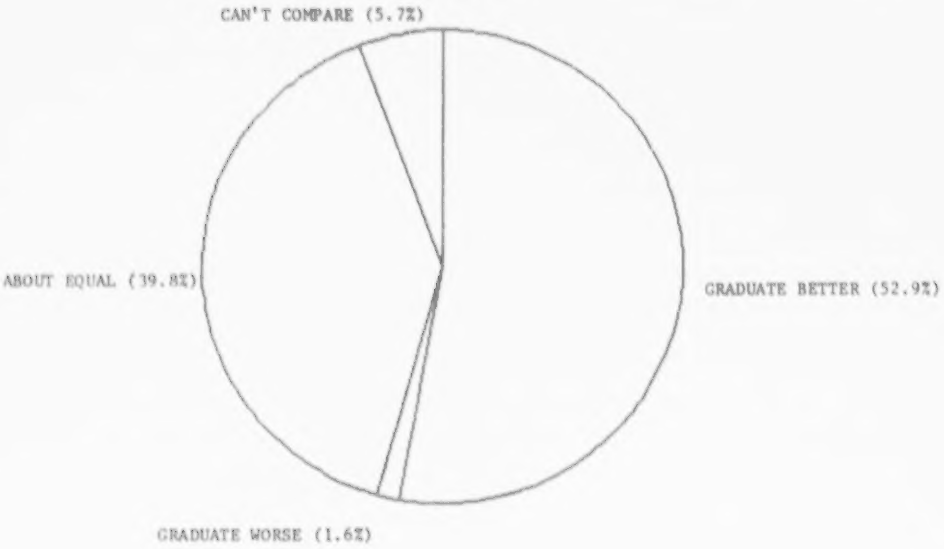
Most of the graduates trained in "blue collar" occupations go directly into jobs following high school. This may partially explain why the schools' job search services are well utilized by these students. Also, many high-paying "blue collar" jobs are often difficult to secure, particularly in manufacturing industries that may not be experiencing employment growth. For this reason it is quite possible that a positive recommendation from the vocational education instructor is of critical importance in securing jobs in these fields. Therefore, graduates from these occupations may be more likely to use placement resources and contacts than their counterparts in other fields.

Both male and female graduates believed that their job performance was at least as good as that of their non-vocationally educated co-workers.

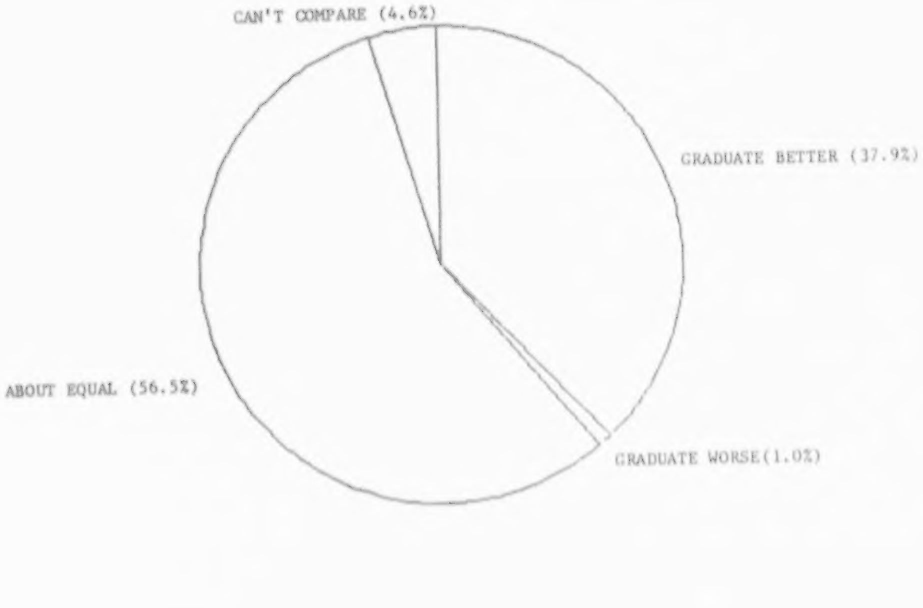
More than nine out of ten graduates believed that they were either as good as nonvocational employees (44.2 percent) or better (48.9 percent). It was the rare graduate--only 1.5 percent of the respondents--who believed that nonvocational co-workers were better on the job. The remaining graduates (5.4 percent) felt they had no basis for comparison. The males were somewhat more likely than females to rate their job performance superior to their non-vocationally educated co-workers. It is possible that this reflects a difference in the level of modesty exhibited by men and women. The employers perception of this same issue discussed in Chapter 6 will shed additional light on this subject.

Graduates' Comparison to Co-Workers

Males



Females



QUESTION: **What is the relationship between student evaluations of vocational education programs and their subsequent self-evaluation of performance on the job?** (Tables 5.6 and 5.7)

Regardless of their perception of vocational education, most graduates rated their job performance very highly. Despite the uniformity, some consistent relationships were found between the evaluations of vocational education and the subsequent on-the-job assessments.

> Those who were most critical of vocational education were also less likely to rate themselves positively on the job.

The table below examines correlations between school and work in two areas. It shows that, in each case, respondents critical of vocational education were less likely to give themselves a strongly positive job evaluation.

Relation Between Perceptions of Training and Job Performance

Overall Rating of Technical Training	Have Technical Skills on Current/ Most Recent Job: Definitely N	Definitely %	Somehwhat N	Somehwhat %	Not at All N	Not at All %
Excellent	449	88.6	48	9.5	10	2.0
Good	466	84.0	74	13.3	15	2.7
Fair/Poor	95	70.3	32	23.7	8	5.9

From the above table, we see for example that 89 percent of those who thought vocational education technical programs were excellent perceived themselves as "definitely" having the technical skills to do their current job. However, among those who rated the technical programs as "fair" or "poor," only 71 percent contend that they "definitely" have the technical skills necessary for their current job.

The academic and technical evaluations of vocational education were also correlated. Those who gave high ratings to academic programs such as reading and math were also more likely to rate technical programs highly.[1]

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[1] The correlation coefficient was .37, where 0 represents no relationship and 1 indicates perfect correlation between the academic and tech-

Summary

This chapter reviewed the graduates' perceptions of their technical and academic preparation for the world of work. On average, the survey results indicate that technical and math preparation was rated considerably higher by students than the instruction they received in more traditional academic areas such as reading and writing. The vast majority of the graduates also reported that their instructors cared about work quality and taught solid work habits. Graduates were somewhat more critical of the teachers' and staffs' helpfulness in the job placement process.

Perceptions of these key issues often differed according to the characteristics of the graduate. For instance, female students tended to rank both their technical and academic education somewhat higher than their male counterparts. Similarly, it was noted that graduates of regional vocational/technical schools perceived their academic and technical preparation more positively than their counterparts from other types of schools. The survey also revealed that virtually all students felt that their job performance was at least as good as their nonvocationally educated co-workers. In fact, nearly half felt that their performance was better. Those students who were most critical of their vocational education were less likely to rate themselves positively on the job.

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nical ratings. The correlation is statistically significant at the .0001 confidence level.

Table 5.1

Graduate Evaluation of the Quality of Academic and Techical Programs

(Row Percentages are Shown)

	Average Score	Excellent (1)	Good (2)	Fair (3)	Poor (4)
Academic Programs					
Reading	2.10	21.4%	51.0%	22.3%	4.5%
Writing	2.18	18.5	50.1	25.4	5.4
Math	1.87	39.4	39.6	14.9	5.6
Science	2.14	24.0	42.1	22.9	7.3
Verbal Skills	2.21	20.6	44.7	25.4	8.1
(Overall Average)	(2.10)				
Technical Programs	1.70	42.5	46.2	10.0	1.3

Table 5.2

Graduate Evaluation of Instruction, Job Placement Efforts, and Job Performance
(Row Percentages are Shown)

	Average Score	Definitely (1)	Somewhat (2)	Not at All (3)
Performance of Shop Instructors				
Up-to-date Technical Knowledge	1.33	69.6%	27.6%	2.7%
Taught Skills Needed for Related Job	1.32	71.3	25.1	3.6
Cared About Work Quality	1.16	85.5	13.1	1.4
Taught Social Skills	1.69	47.8	35.6	16.6
Taught Good Work Habits	1.23	79.7	17.1	3.1
Taught Problem-Solving Skills	1.42	63.8	30.5	5.6
(Overall Average)	(1.36)			
Preparation for Work				
Education Prepares Students for Work	1.50	53.7	42.7	3.6
Teacher/Staff Helpful in Job Placement	1.62	57.5	23.1	19.3
Current/Most Recent Job Performance				
Possess the Necessary Technical Skills	1.18	84.4	12.8	2.8
Boss Satisfied with Work Quality	1.09	90.9	8.4	0.3
Enjoy Working	1.19	83.3	14.6	2.1
Get Along with Co-workers	1.06	93.7	6.1	0.1
Have Good Work Habits	1.11	93.7	6.1	0.1
(Overall Average)	(1.13)			

Table 5.3

Summary Evaluations of School Programs and Current Job Performance

(Average Scores are Shown)

	Good Rating of Instructors?	Academic Instruction	Technical Training	Vocational Education Prepares Students for Work	Good Self-Rating on Most Recent Job?
	1=Definitely 3=Not at All	1=Excellent 4=Poor	1=Excellent 4=Poor	1=Very Well 3=Not at All	1=Definitely 3=Not at All
ALL RESPONDENTS	1.36	2.10	1.70	1.50	1.13
Sex					
Male	1.36	2.13	1.73	1.52	1.13
Female	1.35	2.01	1.63	1.45	1.12
Race					
White	1.36	2.10	1.69	1.49	1.12
Nonwhite	1.40	2.05	1.84	1.57	1.15
Moved > 50 Miles Since Graduation					
Yes	1.46	2.10	1.82	1.48	1.14
No	1.35	2.10	1.69	1.50	1.13
Year of Graduation					
1982-83	1.36	2.08	1.68	1.49	1.11
1983-84	1.36	2.10	1.72	1.50	1.14
Type of Vocational School					
Regional Voc/Tech	1.33	2.05	1.61	1.44	1.13
City/Town Voc/Tech	1.35	2.18	1.77	1.50	1.12
Comprehensive	1.42	2.15	1.88	1.65	1.11
Program Studied in Voc/Tech School					
Agriculture	1.34	1.89	1.54	1.37	1.13
Marketing & Distributive Ed.	1.33	1.92	1.68	1.46	1.13
Health Occupations	1.30	2.09	1.64	1.52	1.13
Consumer & Homemaking	1.29	2.21	1.65	1.53	1.07
Food/Restaurant	1.31	2.01	1.50	1.33	1.16
Business/Office	1.42	2.07	1.88	1.55	1.10
Technical	1.45	2.12	1.80	1.56	1.15
Building Trades	1.32	2.22	1.75	1.52	1.11
Automobile/Engine	1.40	2.16	1.87	1.65	1.16
Machine & Metal Trades	1.35	2.07	1.65	1.48	1.13
Electrical & Appliance	1.30	2.07	1.62	1.49	1.09
Design-Related	1.36	2.07	1.67	1.41	1.12
Custom Finishing	1.36	2.07	1.63	1.48	1.12
Other	1.34	2.10	1.53	1.36	1.06
Economic Region					
Metro Boston	1.38	2.11	1.71	1.51	1.13
Balance of State	1.33	2.08	1.69	1.48	1.13

Table 5.4

Detailed Graduate Evaluations by Sex, Race, and Economic Region

(Average Scores are Shown)

	All Respondents	Average Scores					
		Sex		Race		Economic Region	
		Male	Female	White	Non-white	Metro Boston	Balance of State
Performance of Shop Instructors (1=Definitely, 3=Not at All)							
Overall Performance	1.36	1.36	1.35	1.36	1.40	1.38	1.33
Up-to-date Technical Knowledge	1.33	1.36	1.27	1.33	1.37	1.36	1.27
Taught Skills Needed for Related Job	1.32	1.32	1.33	1.31	1.46	1.35	1.27
Cared About Work Quality	1.16	1.15	1.17	1.16	1.21	1.17	1.14
Taught Social Skills	1.69	1.74	1.57	1.69	1.63	1.71	1.66
Taught Good Work Habits	1.23	1.22	1.26	1.23	1.28	1.25	1.21
Taught Problem-Solving Skills	1.42	1.38	1.50	1.42	1.46	1.41	1.42
Quality of Academic & Technical Programs (1=Excellent, 4=Poor)							
Overall Academic	2.10	2.13	2.01	2.10	2.05	2.11	2.08
Reading	2.10	2.16	1.94	2.11	2.00	2.11	2.08
Writing	2.18	2.25	1.99	2.19	2.06	2.18	2.18
Math	1.87	1.83	1.94	1.87	1.87	1.87	1.85
Science	2.14	2.16	2.08	2.13	2.21	2.16	2.11
Verbal Skills	2.21	2.25	2.11	2.21	2.18	2.22	2.20
Technical Programs	1.70	1.73	1.63	1.69	1.84	1.71	1.69
Preparation for Work (1=Definitely, 3=Not at All)							
Vocational Education Prepares Students for Work	1.50	1.52	1.45	1.49	1.57	1.51	1.48
Teachers/Staff Helpful in Job Placement	1.62	1.60	1.68	1.62	1.69		1.67
Current/Most Recent Job Performance (1=Definitely, 3=Not at All)							
Overall Performance	1.13	1.13	1.12	1.12	1.15	1.13	1.13
Possess the Necessary Technical Skills	1.18	1.19	1.18	1.18	1.27	1.18	1.19
Boss Satisfied with Work Quality	1.09	1.09	1.09	1.09	1.10	1.09	1.09
Enjoy Working	1.19	1.18	1.20	1.19	1.22	1.19	1.18
Get Along with Co-workers	1.06	1.06	1.06	1.06	1.03	1.07	1.06
Have Good Work Habits	1.11	1.11	1.09	1.11	1.12	1.10	1.11

Table 5.5

Detailed Graduate Evaluations by Vocational Program Studied
(Average Scores are Shown)

	All Respondents	Agri-culture	Marketing & Dist. Ed.	Health Occupation	Consumer/ Homemaking	Food/ Restaurant	Business/ Office	Tech-nical
Performance of Shop Instructors (1=Definitely, 3=Not at All)								
Overall Performance	1.36	1.34	1.33	1.30	1.29	1.31	1.42	1.45
Up-to-date Technical Knowledge	1.33	1.31	1.39	1.18	1.12	1.22	1.38	1.36
Taught Skills Needed for Related Job	1.32	1.26	1.39	1.30	1.41	1.19	1.43	1.44
Cared About Work Quality	1.16	1.11	1.21	1.18	1.24	1.17	1.26	1.19
Taught Social Skills	1.69	1.71	1.32	1.45	1.35	1.53	1.63	1.87
Taught Good Work Habits	1.23	1.11	1.39	1.16	1.24	1.14	1.37	1.43
Taught Problem-Solving Skills	1.42	1.51	1.29	1.56	1.41	1.59	1.46	1.39
Quality of Academic & Technical Programs (1=Excellent, 4=Poor)								
Overall Academic	2.10	1.89	1.92	2.09	2.21	2.01	2.07	2.12
Reading	2.10	1.89	1.79	2.04	1.94	2.00	1.87	2.14
Writing	2.18	2.00	2.04	2.11	2.18	2.08	2.11	2.16
Math	1.87	1.83	1.81	1.96	2.47	1.94	1.98	1.79
Science	2.14	1.86	2.26	2.04	2.41	1.93	2.24	2.18
Verbal Skills	2.21	1.91	1.82	2.33	2.06	2.03	2.14	2.34
Technical Programs	1.70	1.54	1.68	1.64	1.65	1.50	1.88	1.80
Preparation for Work (1=Definitely, 3=Not at All)								
Vocational Education Prepares Students for Work	1.50	1.37	1.46	1.52	1.53	1.33	1.55	1.56
Teachers/Staff Helpful in Job Placement	1.62	1.51	1.64	1.89	2.12	1.62	1.86	1.72
Current/Most Recent Job Performance (1=Definitely, 3=Not at All)								
Overall Performance	1.13	1.13	1.13	1.13	1.07	1.16	1.10	1.15
Possess the Necessary Technical Skills	1.18	1.23	1.19	1.25	1.12	1.21	1.08	1.20
Boss Satisfied with Work Quality	1.09	1.14	1.12	1.05	1.00	1.15	1.08	1.06
Enjoy Working	1.19	1.14	1.08	1.24	1.18	1.26	1.22	1.26
Get Along With Co-workers	1.06	1.06	1.16	1.05	1.00	1.06	1.05	1.08
Have Good Work Habits	1.11	1.06	1.12	1.05	1.06	1.13	1.09	1.16

Table 5.5
(continued)

Detailed Graduate Evaluations by Vocational Program Studied
(Average Scores are Shown)

	All Respondents	Building Trades	Auto/ Engine	Machine & Metal Trades	Electrical & Appliance	Design-Related	Custom-Finishing	Other
Performance of Shop Instructors (1=Definitely, 3=Not at All)								
Overall Performance	1.36	1.32	1.40	1.35	1.30	1.36	1.36	1.34
Up-to-date Technical Knowledge	1.33	1.27	1.43	1.44	1.24	1.34	1.30	1.33
Taught Skills Needed for Related Job	1.32	1.27	1.38	1.30	1.27	1.28	1.33	1.31
Cared About Work Quality	1.16	1.07	1.19	1.15	1.13	1.13	1.23	1.11
Taught Social Skills	1.69	1.66	1.79	1.71	1.71	1.70	1.72	1.53
Taught Good Work Habits	1.23	1.20	1.21	1.14	1.17	1.27	1.15	1.20
Taught Problem-Solving Skills	1.42	1.43	1.39	1.34	1.26	1.46	1.45	1.53
Quality of Academic & Technical Programs (1=Excellent, 4=Poor)								
Overall Academic	2.10	2.22	2.16	2.07	2.07	2.07	2.07	2.10
Reading	2.10	2.28	2.13	2.16	2.13	2.06	2.13	1.98
Writing	2.18	2.36	2.24	2.19	2.22	2.13	2.08	2.16
Math	1.87	1.87	1.91	1.73	1.79	1.86	1.82	2.09
Science	2.14	2.27	2.23	2.10	2.13	2.02	2.11	2.19
Verbal Skills	2.21	2.33	2.31	2.21	2.07	2.28	2.17	2.07
Technical Programs	1.70	1.75	1.87	1.65	1.62	1.67	1.63	1.53
Preparation for Work (1=Definitely, 3=Not at All)								
Vocational Education Prepares Students for Work	1.50	1.52	1.65	1.48	1.49	1.41	1.48	1.36
Teachers/Staff Helpful in Job Placement	1.62	1.56	1.70	1.48	1.51	1.53	1.57	1.58
Current/Most Recent Job Performance (1=Definitely, 3=Not at All)								
Overall Performance	1.13	1.11	1.16	1.13	1.09	1.12	1.12	1.06
Possess the Necessary Technical Skills	1.18	1.11	1.28	1.20	1.15	1.16	1.27	1.09
Boss Satisfied with Work Quality	1.09	1.09	1.14	1.10	1.05	1.08	1.08	1.05
Enjoy Working	1.19	1.14	1.20	1.23	1.11	1.23	1.10	1.07
Get Along With Co-workers	1.06	1.07	1.08	1.04	1.08	1.05	1.07	1.00
Have Good Work Habits	1.11	1.13	1.13	1.11	1.08	1.07	1.08	1.11

Table 5.6

Correlation Between Vocational Education and Work Performance: Graduate Perceptions

(Row Percentages are Shown)

	Have Technical Skills on Current/Most Recent Job					
	Definitely		Somewhat		Not at All	
	N	Percent	N	Percent	N	Percent
Instructors Had Up-to-Date Technical Knowledge						
Definitely	711	85.2	99	11.9	24	2.9
Somewhat	273	82.5	50	15.1	8	2.4
Not at All	27	81.8	5	15.2	1	3.0
Overall Quality of Technical Training						
Excellent	449	88.6	48	9.5	10	2.0
Good	466	84.0	74	13.3	15	2.7
Fair	87	72.5	27	22.5	6	5.0
Poor	8	53.3	5	33.3	2	13.3

	Boss Satisfied With Job Performance					
	Definitely		Somewhat		Not at All	
	N	Percent	N	Percent	N	Percent
Instructors Had Up-to-Date Technical Knowledge						
Definitely	774	93.4	53	6.4	2	0.2
Somewhat	287	87.2	41	12.5	1	0.3
Not at All	26	81.2	6	18.8	0	---
Overall Quality of Technical Training						
Excellent	476	94.3	27	5.4	2	0.4
Good	501	91.1	48	8.7	1	0.2
Fair	98	82.4	21	17.6	0	---
Poor	11	73.3	4	26.7	0	---

Table 5.6
(continued)

Correlation Between Vocational Education and Work Performance: Graduate Perceptions

(Row Percentages are Shown)

	Get Along With Co-workers on Job					
	Definitely		Somewhat		Not at All	
	N	Percent	N	Percent	N	Percent
Instructors Taught Social Skills						
Definitely	546	96.1	22	3.9	0	---
Somewhat	392	92.0	33	7.8	1	0.2
Not at All	181	91.0	18	9.0	0	---

	Good Work Habits on Job					
	Definitely		Somewhat		Not at All	
	N	Percent	N	Percent	N	Percent
Instructors Taught Good Work Habits						
Definitely	872	91.5	81	8.5	0	---
Somewhat	164	80.4	39	19.1	1	0.5
Not at All	33	91.7	2	5.6	1	2.8

Table 5.7

Graduate Evaluations of Various Vocational Education and Work Quality Components

	Quality of Instructors	Academic Quality	Technical Quality	Quality of Work on Current/Most Recent Job
Quality of Instructors	---	0.353	0.554	0.214
Academic Quality	0.353	---	0.369	0.123
Technical Quality	0.554	0.369	---	0.191
Quality of Work on Current/Most Recent Job	0.214	0.123	0.191	---

Note: All of these correlations are significantly different than zero at the .0001 confidence level.

Numbers shown are correlation coefficients. For example, graduates' evaluations of technical and academic programs are fairly consistent, with a correlation of 0.353. There is less of a correlation between, for example, academic programs and on the job work quality assessments (correlation of 0.123).

CHAPTER 6

EMPLOYERS' ASSESSMENT OF THE GRADUATES

In addition to directly soliciting evaluative feedback from vocational education graduates themselves, this research also entailed a survey of employers who supervised them in the work place. An interview with the employer was conducted only if the graduate granted permission and provided us with the name and address for contact purposes. A more detailed discussion of the survey methodology is contained in Appendix II.

The survey was conducted primarily to assess the employers' satisfaction with recent vocational graduates. The supervisors rated these employees along many of the same criteria as the graduates had rated themselves: the quality of the workers' technical and problem-solving skills, their work habits and co-worker relations, and their overall ability as compared to their nonvocationally educated counterparts. Employers also gauged the level of the graduates' academic skills, and the relationship between the current jobs and the occupations studied in school.

Beyond simply reporting on the employers' assessment of vocational graduates, a correlation of the two surveys allows us to compare the supervisors' evaluations with employees' self-assessments. Also, such a correlation allows for a limited comparison between the graduates' evaluation of vocational education programs on the one hand, and the employers' assessment of the quality of these workers on the other.

QUESTION: **What type of graduates allowed us to contact their supervisors? Was there any bias in the sample of employers contacted?** (Table 6.1)

It is important to begin the analysis of the employer survey with a brief discussion of the survey methodology and its potential implications. Ideally, a random sample of graduates provides us with survey respondents representative of all vocational education graduates; the supervisors surveyed are, in turn, a random and thus representative group of employers. Thus, the survey results are likely to present a statistically accurate picture of the vocational education system as a whole.

Despite interviewers' assurances about the confidentiality of the data collected, there was the potential that only graduates who were doing well on their jobs would allow us to contact their employers. If so, the graduates would have "self-selected" for us mostly those supervisors who would give positive marks to vocational graduates. Thus it would be difficult to generalize from the survey results to the population of vocational employees as a whole.

> It appears that the supervisors responding to the survey are broadly representative of the larger population of employers. What the respondents say about vocational education graduates is likely to be consistent with the opinions and observations of other employers across the state.

There is little evidence of self-selection in the employer survey toward only successful graduates. First of all, most of the former students agreed to let us contact their employers. Of the 1,054 employed graduates responding to the survey, almost three out of four (74 percent) provided us with their supervisor's name and address.

Bias towards high performing graduates would most likely reveal itself in higher than average wages. However, as shown in the chart below, the average wages for full-time workers in the two samples were almost identical.

Average Wages for Full-Time Workers

	All Graduates	Those Giving Permission to Survey Their Employer
All Full-Time Workers	$8.14	$7.90
Male	$8.64	$8.40
Female	$6.65	$6.60

Table 6.1 at the end of this chapter provides additional comparisons between all survey respondents and those included in the employer survey. Across most variables the two groups are virtually identical. An exception is type of school: regional vocational technical students are slightly overrepresented in the employer survey (65 percent versus 60 percent overall), and students from comprehensive schools are somewhat underrepresented (21 percent versus 25 percent overall).

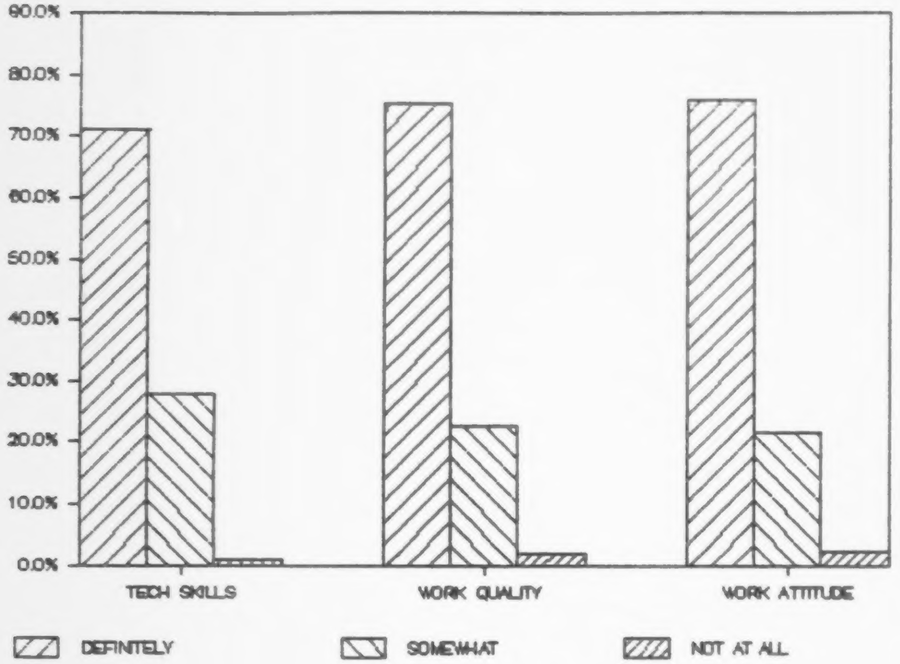
Although the reason is not clear, employees from the comprehensive schools were less likely than others to allow us to send their boss a survey (65 percent versus 77 percent, respectively). This explains their slight underrepresentation among employer survey respondents.

QUESTION: How did employers rate vocational graduates on the job? (Table 6.2)

Employers were asked whether they were satisfied with various components of the graduates performance on the job. A three-point scale was used: (1) definitely, (2) somewhat, and (3) not at all.

Approximately three out of every four employers were quite satisfied with the graduates' technical skills, overall work quality, and attitude toward work.

Employers' Evaluation of Graduates' Job Performance

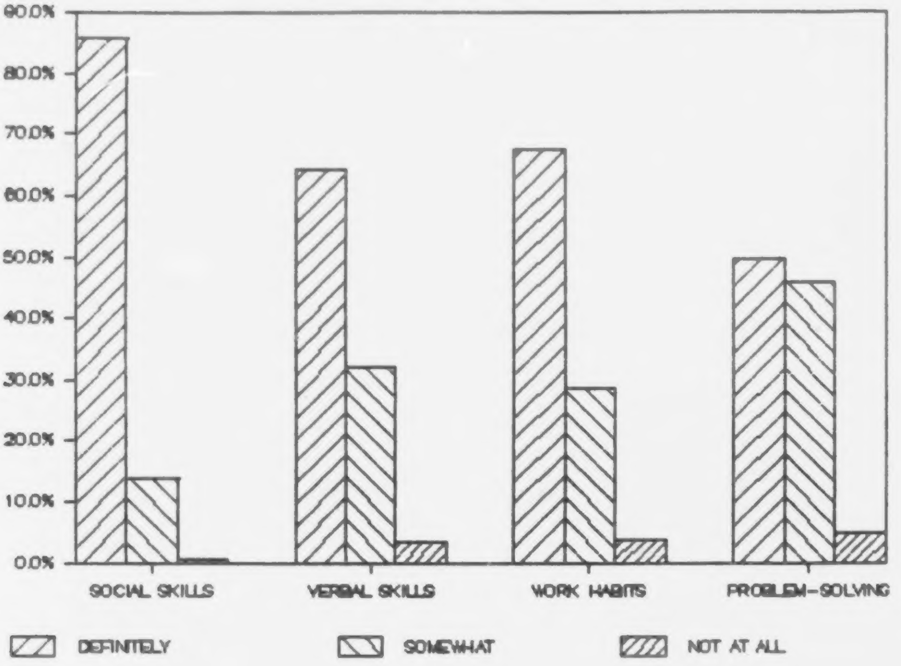


As seen on the chart above, over 70 percent of the employers believed that vocational graduates "definitely" had the technical skills to do the job. Work quality and work attitude were "definitely" acceptable to over 75 percent of the employers. While a substantial minority were only "somewhat" satisfied, less than 3 percent of the employers were completely dissatisfied with the graduates' technical skills, quality of workmanship, or work attitude.

Notice that these scores, while very positive, are not as lauditory as the graduates own self-assessments. For example, 94 percent of the graduates in the employer survey believed that their boss was "definitely" satisfied with their job performance, when in fact one out of four supervisors reported less than full satisfaction with the graduate's work quality. Similarly 85.8 percent of the employees reported that they "definitely" had the technical skills to do the job, while only 71.1 percent of their employers thought similarly.

> Employers were in general favorably impressed with the graduates' ability to work alongside others. While two out of three employers were "definitely" satisfied with the graduates' work habits, only half felt the employees "definitely" had good problem-solving skills.

Employers' Evaluation of Graduates' Job Performance



From the above chart, we see that over 85 percent of the employers reported that the graduates "definitely" got along with co-workers. This was the highest positive rating of any of the employee evaluation criteria and was generally consistent with the graduates' own rating.

The biggest disparity arose in the respective ratings of work habits. Nearly 90 percent of the students felt they "definitely" had good habits compared to only 67.4 percent of the employers. Since some degree of disparity would be expected in all of these ratings, the size of the gap is less alarming than the fact that nearly one-third of all employers surveyed were less than fully satisfied with the students' work habits. This is of particular concern since employers of young entry-level workers often tend to value solid work habits more than the technical skills themselves. This finding is also of concern since the graduates reported quite uniformly that instructors taught them good work habits.

The question arises from this disparity: what exactly is meant by work habits? Although not asked to define their understanding of it, several employers in their comments clarified what exactly they were dissatisfied with.

- "More emphasis is needed on work habits and attitudes. The voc grads I've hired all seem to have too relaxed an attitude about their work--they don't seem to care."
- "(Graduate) is a very nice person with good technical skills but no grooming or customer relation thoughts. Vocational schools seem to teach technical skills but kids are allowed to grow up as slobs."
- "His work shows an extreme lack of proper training. I would estimate an apprenticeship program of at least 2 years before I would let (him) complete a job unsupervised."

It seems that work habits, quality and attitude are all closely interrelated, and may actually be inseperable in reality, all based on the interest one takes in one's work and the care with which one performs the job. Some employers seemed to view it as a problem of motivation, an issue any type of high school would find difficult to address: "A person's success is totally a function of his own motivation. Voc schools may provide the skills--as a tool to get a job, but it will ultimately depend upon the individual's attitude and motivation."

Finally, we should note that over half the employers believed that the graduates' problem-solving skills were either "somewhat" acceptable (46 percent) or completely unsatisfactory. In light of this finding, it is interesting to recall that many of the graduates (40 percent) reported that their shop instructors did not place a great deal of emphasis on problem-solving skills. However, there does not seem to be any simple relationship between the instructor's emphasis on problem solving as reported by the graduate and the employer's later evaluation--no statistically significant correlation between the two was found.

> Of those employers who could compare the graduate to his or her nonvocationally educated co-workers, almost 60 percent believed that the vocational graduate was a better worker.

About four out of five employers believed that they could make a legitimate comparison between the graduate and nonvocational co-workers. Of these, 5 percent thought the co-workers were better, 35 percent believed that vocational workers and their co-workers were about equal, and 58 percent report that the vocational graduates were actually better. Some employers commented specifically on why they considered vocational graduates better than co-workers.

- "I would have to say that people from vocational schools seem to have much more common sense and the ability to handle daily problems better than regular high school people.
- "I feel that most vocational students have the work ethic."
- "Having a vocational background is a distinct advantage. (Graduate) displays theoretical knowledge in the (food) business, and the basic practical knowledge necessary to perform on an overall consistent basis."

Again, some employers expressed the view that vocational education was not the key factor in determining one's success on the job, but rather that it was a question of one's own motivation: "Even if a person is well trained, he won't get anywhere unless he has the desire to do a job to the best of his or her ability. I have worked with trained and untrained people: no desire, no success."

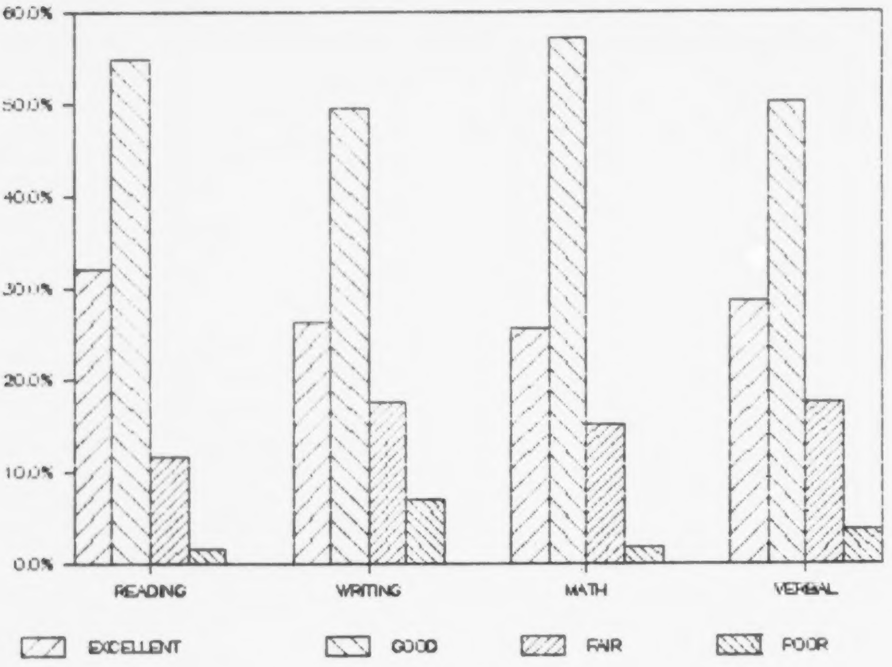
Employer comparisons of the graduates are very similar to the employees' self-evaluations. Among the exact same workers who were compared by their supervisors to their nonvocational counterparts, 59 percent thought themselves better than co-workers, 40 percent thought they were about equal, and only 1 percent thought the nonvocational workers were better.

QUESTION: **How did the employers rate the graduates' academic education?** (Table 6.3)

Employers were asked to rate the workers' academic preparation along the same scale used by the graduates themselves: (1) excellent, (2) good, (3) fair, and (4) poor. Reading, writing, math, and verbal skills education were assessed. While the employers attempted to rate educational quality, it should be noted that they only observe this indirectly in the employees' performance on the job. It is likely that what they were in fact rating was the graduates' ability and use of these academic skills in the work environment.

> Reading and math education were each rated "excellent" or "good" by about 85 percent of the supervisors. Writing and verbal education received positive ratings by 75-80 percent of the supervisors.

Employers' Evaluation of Graduates' Academic Preparation



The chart above summarizes the academic ratings. While the reading evaluations were especially positive (87 percent "excellent" or "good"), mathematics was not far behind (84 percent). Writing programs received the weakest endorsement: almost one out of every four employers thought writing skills were either "fair" (17 percent) or "poor" (7 percent). Several employers commented on the importance of writing and verbal skills on the job, and the fact that inadequate preparation in these areas will hinder the graduates' progress.

- "He can't spell or write so he can't represent the company publicly--and is limited for advancement."
- "Writing and verbal skills are very much below expected levels. I believe vocational high school graduates must also be skilled in these areas--especially writing."

But as one employer points out, inadequate preparation in basic academic skills is a problem not limited to vocational high schools. "His spelling and writing of reports is atrocious. Does not know present--past tense (in writing). Orally, he does fine. Exceptional, really. Cannot condemn voc education for this, as many of our high school graduates are no better."

It is interesting to note that employers gave most of the academic programs a more positive rating than the graduates themselves did.

	Percent Rating "Excellent" or "Good"	
Academic Component	Supervisors	Employees
Reading	87%	75%
Writing	76%	72%
Math	83%	81%
Verbal Skills	79%	66%

As can be seen in the above table, the largest differences in supervisor/employee ratings of academic programs were in the areas of reading and verbal skills education. Graduates were substantially more critical of these programs than their supervisors. Thus, despite the dissatisfaction of a number of graduates with the quality of their reading education and their verbal expression, most of their current employers believe that vocational programs were generally successful in these areas.

QUESTION: How do the employer evaluations vary by the graduates' personal characteristics or program studied? (Tables 6.4-6.5)

In order to provide more detail on the employer evaluations, averages of the survey ratings were taken across the various personal and programmatic characteristics. As was noted previously a lower average indicates a more positive rating by the employer.

Employers rated females higher than males in almost every academic category and across most measures of job performance.

Without controlling for program studied, it is clear that female employees received better employer evaluations than males in almost every category (see table below).

Average Score Given by Employers

	Males	Females	White	Non-White
JOB PERFORMANCE (1=Definitely, 3=Not at all)				
Has good technical skills	1.33	1.23	1.30	1.32
Satisfied with work performance	1.30*	1.20	1.27	1.25
Has a positive attitude	1.29**	1.17	1.27	1.10
Gets along with co-workers	1.15	1.15	1.15	1.05
Expresses self well verbally	1.41	1.34	1.40	1.25
Has good work habits	1.40	1.28	1.37	1.30
Has good problem-solving skills	1.58	1.50	1.57	1.37
ACADEMIC EDUCATION (1=Excellent, 4=Poor)				
Reading	1.90**	1.65	1.84	1.79
Writing	2.14**	1.84	2.07	2.06
Math	2.01**	1.73	1.95	1.79
Verbal	2.04**	1.76	1.97	1.89

*Significant difference by sex at the .05 confidence level.
**Significant difference by sex at the .01 confidence level.

Because of the graduates' tendency to cluster by sex across occupations, it is difficult to fully determine whether this result holds within occupational categories. Technical programs, however, do graduate enough males and females to make a within-occupation comparison. When technical employees are compared to each other, we find that the sex differences in employer evaluations largely disappear. In a few of the academic categories (reading, verbal skills), average rating scores for female technical workers were better than those for males, with differences statistically significant. But there were no statistically significant differences between the rankings for male and female technical workers on any of the on-the-job evaluation components.

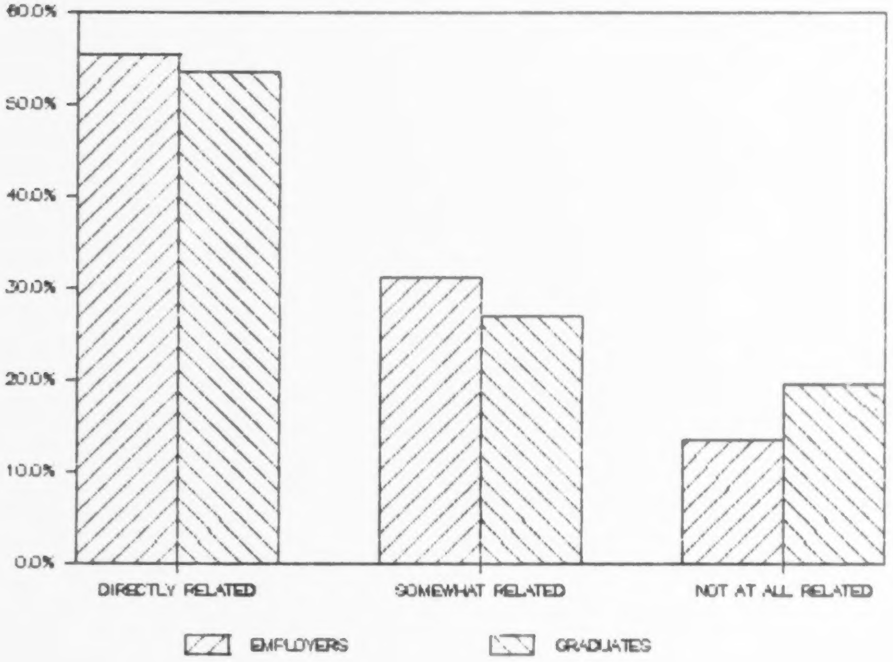
The data above also indicate that employers tended to rate nonwhite employees slightly higher than white graduates. Although the differences are not sizeable there is quite a consistent trend with respect to both job performance and their academic education.

QUESTION: **Did employers report that the graduates are in training related jobs?** (Tables 6.6-6.7)

Prior to reporting any results it should be noted that not all employers were capable of commenting on this issue since they were not aware that their employee was a graduate of a vocational education program. Specifically, 76 percent of the employers reported that they were aware of the employees vocational background and they will form the basis for addressing this issue.

> Among employers aware of their worker's vocational education, 87 percent said the current job was either "definitely" or "somewhat" training related.

Training Relatedness of Jobs: Employer vs. Graduate View



As can be seen on the above chart, the employers were slightly more likely than the workers to believe that a job was training related. The percentage of jobs considered "directly related" was almost identical for the employers and the workers (55 percent versus 54 percent).

There was substantial variation in the rating of training relatedness across occupational categories. Supervisors reported placement in directly related jobs for over 60 percent of those trained in the building trades, automobile/engine, machine and metal trades, and electrical and appliance occupations. This is quite consistent with the graduates' views of themselves.

Employers of graduates from marketing and distributive education, health, consumer, business/office, and cosmetology reported only 38 percent of the jobs to be directly training related. This conforms with the view of the employees themselves: only 41 percent of those trained in these occupations said that they are currently employed in "directly" related jobs.

It should be stressed again that the absence of a training related position does not necessarily imply that curriculum offerings were inconsistent with local labor market needs or that graduates were inadequately prepared for their field. In fact, it may simply reflect the disparity between the interests exhibited by students in school and their ability to earn a self-sustaining wage in that field.

Summary

This final chapter examined the perceptions of employers who directly supervised graduates of vocational programs. Overall, employers were highly satisfied with the graduates' capabilities and performance as measured in a number of ways. Specifically, three out of four employers surveyed reported satisfaction with the graduates' technical skills and overall work quality. Slightly lower ratings, albeit still quite positive, were reported with respect to graduates' problem-solving skills and overall work habits. A comparison with the graduates' self-assessment along similar dimensions revealed sizeable discrepancies in most areas. Not surprisingly, graduates were more likely to give themselves higher assessments than their employers. Most noteworthy was the rating of work habits where nearly 90 percent of the former students felt they "definitely" had good work habits compared to only 67 percent of their employers.

Employers were also asked to rate their employees' academic skills. Overall their perceptions were quite positive particularly with respect to reading and math. Specifically, "excellent" or "good" ratings were given by employers in these academic areas 87 percent and 83 percent of the time, respectively. Writing and verbal skills received somewhat lower ratings (76 percent and 79 percent respectively). Interestingly, employers were more likely to rate the graduates' academic preparation higher than the graduates rated their own academic preparation. Thus despite the dissatisfaction of a number of graduates with certain academic components, most of their current employers felt that vocational programs were generally successful in these areas.

Finally, it should be noted that employers tended to give women and minorities somewhat higher ratings with respect to both current job performance and academic preparation.

Table 6.1

Comparison Between All Respondents and Those in Employer Survey

(Column Percentages are Shown)

	All Graduates		Those in Employer Survey	
	N	Percent	N	Percent
ALL RESPONDENTS	1,210	100%	439	100%
Sex				
Male	866	71.6	312	72.7
Female	344	28.4	117	27.3
Race				
White	1,136	94.0	406	94.9
Nonwhite	68	5.6	20	4.7
Moved > 50 Miles Since Graduating				
Yes	79	6.6	19	4.4
No	1,126	93.4	410	95.6
Year of Graduation				
1982-83	622	52.1	222	52.9
1983-84	571	47.9	198	47.1
Type of Vocational School				
Regional Voc/Tech	729	60.3	274	64.2
City/Town Voc/Tech	175	14.5	64	15.0
Comprehensive	304	25.2	89	20.8
Program Studied in Voc/Tech School				
Agriculture	35	2.9	11	2.6
Marketing & Distributive Ed.	28	2.3	5	1.2
Health Occupations	56	4.7	20	4.7
Consumer & Homemaking	17	1.4	4	.9
Food/Restaurant	64	5.3	23	5.4
Business/Office	65	5.4	21	4.9
Technical	143	11.9	59	13.8
Building Trades	132	11.0	44	10.3
Automobile/Engine	141	11.7	49	11.5
Machine & Metal Trades	151	12.5	66	15.5
Electrical & Appliance	132	11.0	43	10.1
Design-Related	135	11.2	54	12.6
Custom Finishing	60	5.0	13	3.0
Other	45	3.7	15	3.5
Economic Region				
Metro Boston	746	61.8	255	59.7
Balance of State	462	38.2	172	40.3

Table 6.1
(continued)

Comparison Between All Respondents and Those in Employer Survey
(Column Percentages are Shown)

	All Graduates		Those in Employer Survey	
	N	Percent	N	Percent
Current Wage				
$5 or less	85	9.2	49	11.9
$5.01 to 6.00	112	12.2	53	12.9
$6.01 to 7.00	163	17.7	77	18.7
$7.01 to 8.00	178	19.3	76	18.5
>$8.00	383	41.6	156	38.0
On-the-Job Self-Evaluation				
Has Technical Skills				
Definitely	1,012	84.4	368	85.8
Somewhat	154	12.8	49	11.4
Not at All	33	2.8	12	2.8
Supervisor Satisfied				
Definitely	1,087	90.9	400	93.5
Somewhat	101	8.4	27	6.3
Not at All	3	0.3	1	0.2
Quality of Academics (Graduate Responses)				
Reading				
Excellent	259	21.4	102	24.0
Good	616	51.0	216	50.8
Fair	270	22.3	98	23.1
Poor	54	4.5	9	2.1
Writing				
Excellent	223	18.5	95	22.4
Good	604	50.1	211	49.6
Fair	306	25.4	105	24.7
Poor	65	5.4	14	3.3
Math				
Excellent	476	39.4	184	43.0
Good	478	39.6	161	37.6
Fair	180	14.9	57	13.3
Poor	67	5.6	26	6.1
Training Relatedness				
Directly Related	423	38.7	196	45.7
Somewhat Related	298	27.3	119	27.7
Not Related	371	33.9	114	26.6

Table 6.2

Employer and Employee Evaluations of Vocational Education Graduates' Performance on the Job

(Row Percentages are Shown)

Characteristic of Graduate	Coefficient Correlation	Definitely (1)	Somewhat (2)	Not at All (3)
Has Technical Skills	.043			
Employer		71.1	27.9	0.9
Employee		85.8	11.4	2.8
Supervisor Satisfied with Work Quality	.240*			
Employer		75.3	22.7	2.1
Employee		93.5	6.3	0.2
Positive Work Attitude/ Enjoy Work	.102*			
Employer		76.1	21.6	2.3
Employee		81.1	17.7	1.2
Gets Along with Co-workers	.047			
Employer		85.8	13.7	0.5
Employee		93.4	6.6	0.0
Education Prepared Students to Earn Living	.142*			
Employer		58.5	33.2	8.2
Employee		58.4	40.0	1.6
Good Work Habits	.047			
Employer		67.4	28.7	3.9
Employee		89.5	10.0	0.5
Good Problem Solving Skills**				
Employer		49.5	45.6	4.9
Expresses Self Well Verbally**				
Employer		64.4	32.2	3.4

Note: Employee responses are only for those included in Employer Survey.

*Indicates significant correlation between employer/employee ratings at the .05 level.

**Graduates were not asked about their verbal expression or problem-solving skills on the job; therefore no correlation can be calculated in these cases.

Table 6.3

Employer and Employee Evaluations of Vocational Education Graduates' Academic Skills

(Row Percentages are Shown)

Academic Skills	Coefficient Correlation	Excellent (1)	Good (2)	Fair (3)	Poor (4)
Reading	.088*				
Employer		32.0	54.9	11.6	1.5
Employee		24.0	50.8	23.1	2.1
Writing	.071				
Employer		26.2	49.6	17.4	6.8
Employee		22.4	49.6	24.7	3.3
Math	-.039				
Employer		25.7	57.4	15.0	1.9
Employee		43.0	37.6	13.3	6.1
Verbal	-.073*				
Employer		28.6	50.2	17.5	3.7
Employee		19.6	45.9	27.0	7.4

*Significant correlation at the 0.15 level.

Table 6.4

Employer Evaluation of Job Performance by Respondent Characteristics

(1=Definitely, 3=Not at All)

	Overall Average Score	Technical Skill	Work Quality	Positive Attitude	Good Co-worker Relations	Verbal Ability	Work Habits	Problem-Solving Skills
ALL RESPONDENTS	1.32	1.30	1.27	1.26	1.15	1.39	1.36	1.55
Sex								
Male	1.35	1.33	1.30	1.29	1.15	1.41	1.40	1.58
Female	1.27	1.23	1.20	1.17	1.15	1.34	1.28	1.50
Race								
White	1.33	1.30	1.27	1.27	1.15	1.40	1.37	1.57
Nonwhite	1.23	1.32	1.25	1.10	1.05	1.25	1.30	1.37
Moved > 50 Miles Since Graduation								
Yes	1.38	1.28	1.26	1.37	1.26	1.56	1.47	1.53
No	1.33	1.30	1.27	1.26	1.14	1.39	1.36	1.56
Year of Graduation								
1982-83	1.32	1.33	1.26	1.24	1.16	1.41	1.33	1.53
1983-84	1.34	1.27	1.29	1.29	1.14	1.37	1.41	1.59
Type of Vocational School								
Regional Voc/Tech	1.34	1.30	1.29	1.27	1.16	1.40	1.38	1.57
City/Town Voc/Tech	1.42	1.42	1.36	1.37	1.20	1.52	1.38	1.66
Comprehensive	1.24	1.22	1.16	1.15	1.08	1.29	1.31	1.47
Program Studied in Voc/Tech School								
Agriculture	1.26	1.18	1.18	1.00	1.09	1.55	1.18	1.64
Marketing & Distributive Ed.	1.06	1.00	1.00	1.00	1.00	1.00	1.20	1.25
Health Occupations	1.27	1.16	1.21	1.26	1.21	1.26	1.37	1.47
Consumer & Homemaking	1.32	1.50	1.50	1.25	1.00	1.50	1.25	1.33
Food/Restaurant	1.35	1.30	1.39	1.30	1.13	1.26	1.39	1.65
Business/Office	1.30	1.29	1.19	1.14	1.10	1.43	1.38	1.57
Technical	1.26	1.19	1.20	1.28	1.14	1.30	1.32	1.44
Building Trades	1.36	1.33	1.36	1.30	1.11	1.50	1.34	1.59
Automobile/Engine	1.35	1.35	1.33	1.29	1.06	1.43	1.51	1.48
Machine & Metal Trades	1.42	1.39	1.26	1.30	1.27	1.52	1.48	1.68
Electrical & Appliance	1.39	1.33	1.40	1.37	1.19	1.37	1.47	1.63
Design-Related	1.31	1.25	1.21	1.23	1.17	1.43	1.30	1.58
Custom Finishing	1.37	1.69	1.38	1.31	1.08	1.31	1.17	1.62
Other	1.12	1.27	1.07	1.00	1.07	1.13	1.00	1.33
Economic Region								
Metro Boston	1.32	1.29	1.25	1.23	1.15	1.39	1.35	1.56
Balance of State	1.35	1.32	1.30	1.30	1.14	1.41	1.38	1.57

Table 6.5

Employer Evaluation of Academic Skills by Respondents Characteristics

(1=Excellent, 4=Poor)

	Average Academic Score	Average			
		Reading	Writing	Math	Verbal
ALL RESPONDENTS	1.94	1.83	2.05	1.93	1.96
Sex					
Male	2.02	1.90	2.14	2.01	2.04
Female	1.74	1.65	1.84	1.73	1.76
Race					
White	1.95	1.84	2.07	1.95	1.97
Nonwhite	1.84	1.79	2.06	1.79	1.89
Moved > 50 Miles Since Graduation					
Yes	2.06	1.82	1.94	2.12	2.05
No	1.94	1.84	2.07	1.93	1.96
Year of Graduation					
1982-83	1.95	1.85	2.10	1.93	1.94
1983-84	1.95	1.83	2.04	1.95	2.00
Type of Vocational School					
Regional Voc/Tech	1.92	1.81	2.02	1.89	1.96
City/Town Voc/Tech	2.07	1.92	2.23	2.06	2.07
Comprehensive	1.95	1.86	2.08	2.01	1.90
Program Studied in Voc/Tech Schools					
Agriculture	1.98	1.82	2.00	2.25	2.20
Marketing & Distributive Ed.	1.62	1.75	1.60	1.75	1.40
Health Occupations	1.62	1.53	1.65	1.73	1.65
Consumer & Homemaking	2.39	2.33	3.00	2.00	2.33
Food/Restaurant	1.89	1.82	2.06	1.82	1.90
Business/Office	1.75	1.63	2.00	1.67	1.75
Technical	1.85	1.69	2.00	1.73	1.89
Building Trades	2.11	2.03	2.28	2.03	2.10
Automobile/Engine	1.92	1.81	1.89	1.95	2.04
Machine & Metal Trades	2.13	2.02	2.28	2.15	2.11
Electrical & Appliance	1.96	1.79	2.05	2.05	1.98
Design-Related	1.96	1.85	2.08	1.89	1.98
Custom Finishing	2.14	2.09	2.27	2.09	2.09
Other	1.50	1.55	1.55	1.64	1.42
Economic Region					
Metro Boston	1.94	1.83	2.05	1.95	1.96
Balance of State	1.96	1.85	2.09	1.92	1.97

Table 6.6

Employer Evaluation of Training Relatedness and Overall Ability

(Column Percentages are Shown)

	N	Percent
Training Related		
Definitely	191	48.7
Somewhat	128	32.7
Not at All	73	18.6
Comparison Between Vocational Graduates and Non-Vocational Coworkers		
Graduate better	198	46.9
Coworkers better	21	5.0
Graduate & Coworker equal	119	28.2
Can't Compare	84	19.9

Table 6.7

Training Relatedness, by Program Studied*

(Row Percentages are Shown)

Assessment of Training Relatedness

Vocational Program Studied	N	Supervisor			Employee		
		Directly Related	Somewhat Related	Not at All Related	Directly Related	Somewhat Related	Not at All Related
ALL RESPONDENTS	314	55.4%	31.2%	13.4%	53.5%	26.9%	19.6%
Agriculture	9	22.2	44.4	33.3	22.2	33.3	44.4
Marketing/Distributive Ed.	4	25.0	50.0	25.0	50.0	25.0	25.0
Health Aide/Technician	11	27.3	45.4	27.3	27.3	36.4	36.4
Consumer/Homemaker	1	0.0	100.0	0.0	100.0	0.0	0.0
Food/Restaurant	12	58.3	41.7	0.0	71.4	0.0	28.6
Business/Office	11	54.6	36.4	9.1	41.7	41.7	16.7
Computer/Tech	33	54.6	30.3	15.2	42.4	42.4	15.2
Building Trades	35	62.9	28.6	8.6	68.6	20.0	11.4
Automobile/Engine	40	62.5	17.5	20.0	56.1	22.0	22.0
Machine & Metal	56	62.5	30.4	7.1	60.3	24.4	15.5
Electrical Appliance	32	65.6	28.1	6.2	73.5	17.6	8.8
Design-Related	41	56.1	29.3	14.6	45.2	33.3	21.4
Custom Finishing	9	22.2	55.6	22.2	0.0	60.0	40.0
Other	10	40.0	30.0	30.0	45.4	18.2	36.4

*Note: In this table cases were included only if the employer was aware of the employee's vocational education.

APPENDIX I

TECHNICAL ANALYSIS OF WAGE VARIATION

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TECHNICAL ANALYSIS OF WAGE VARIATION

The crosstabular analysis in Chapter 3 indicated that wages for graduates tend to vary by year of graduation, occupation studied, job tenure, economic region, and gender. Although the simple descriptive statistics presented there allow for an easy, clear reading of the results, the findings are somewhat difficult to interpret. The limitation stems from the inability to control for more than one or two factors at a time.

For example, when reporting on wages by type of school, economic region is not controlled for. Therefore, if wages vary by type of school, the reason may be that schools of a particular type (e.g. regional voc/techs) are concentrated in a particular economic region of the state (e.g. Balance of Massachusetts). If so, we do not know whether to attribute the wage variation to intrinsic characteristics of the school types, or, alternatively, to their location within the state.

In this Appendix, the technique of multiple regression analysis is introduced to test the statistical validity of some of the wage findings presented in Chapter 3. The technique allows the analyst to control for a number of independent factors (or variables) at once. By doing so, the impact of any single factor (e.g. gender or occupation) can be observed, while controlling for variation in other variables (e.g. school type, tenure on the job, etc.).

The available data allow us to control for the following factors, which may or may not influence wages:

Graduate personal and programmatic characteristics

- Sex and race
- Year of graduation
- Economic region
- Type of school
- Type of occupational training
- Approval to send supervisor a survey

Graduate labor market experience

- Labor market status in 1985
- Tenure on the current job
- Relationship between current job and occupational training
- Moved > 50 miles since graduation

Graduate evaluation of vocational programs/work performance

- Quality of instruction
- Quality of academic preparation
- Quality of technical program
- Self-evaluation of work performance
- School placement effort

The estimations were run for full-time workers only. The overall regression results are presented in Table A.1. The following section describes the findings and offers a guide for interpreting the statistics presented.

Regression analysis requires the specification of a "baseline" respondent against whom the wages of all other respondents are compared. Here the equation was specified to estimate the average wage of a baseline graduate with the following attributes: a white female technical graduate from the class of 1983 who had not moved more than 50 miles away from home; who gave negative ratings to vocational school technical and placement programs; who was not in a training-related job; who was working her first full-time job since the time of the survey and had less than six months of job tenure, and who attended a regional voc/tech school outside the metro-Boston area.

Reading off of Table A.1, the parameter estimate for the regression intercept ($6.23) is the expected wage for a graduate with the "baseline" attributes listed above. Notice that this is very close to the actual average wage for all females working full-time ($6.65).

Reading down Table A.1, the parameter estimates indicate whether particular graduate attributes tend to increase or decrease wage levels. Parameter estimates with asterisks indicate a high probability that the associated graduate attribute has a measurable (non-zero) impact on wages. The estimate itself (known as the "coefficient") is a measure of the size of the wage effect--a negative sign indicates that the variable tends to lower wage levels.

Table A.1

Regression Results for Full-Time Workers
(Controlling for Sex and Program)

Dependent Variable: Hourly Wage
Mean Wage: $8.14
Number of Observations: 816

F Statistic: 6.637
Prob > F: 0.0001

Variable	Parameter Estimate	Standard Error
Intercept	6.23**	0.979
Moved > 50 Miles Since Graduation	-0.34	0.405
Approval to Send Boss a Survey	-0.90**	0.210
Overall Quality of Instruction (3=low, 1=high)	0.37	0.318
Overall Quality of Academics (4=low, 1=high)	0.26	0.169
Overall Self-evaluation of Work Performance (3=low, 1=high)	-1.78**	0.475
School Placement Effort Helpful		
Somewhat	-0.41	0.278
Definitely	-0.29	0.252
Technical Quality of Vocational Education is Good		
Somewhat	0.36	0.314
Definitely	0.57	0.356
Number of Full-Time Jobs Since Graduation		
Two	0.09	0.223
Three or more	0.05	0.246
Full-time Workers in Fall 1985	0.75**	0.301
Male	1.57**	0.282
Minority	0.22	0.396
Training Relatedness		
Somewhat Related	0.49*	0.232
Directly Related	0.63**	0.222
Tenure on Current Job		
6-12 Months	0.35	0.266
Year or Longer	0.62**	0.250
1984 Graduate	-0.45**	0.175
Metro Boston Economic Region	0.89**	0.184
City/Town Vocational School	0.11	0.252
Comprehensive Vocational School	-0.20	0.227

Note: Controls were included for program studied. See text for details.
*Significant at .05 confidence level.
**Significant at .01 confidence level.

The table indicates that the following graduate attributes have a high statistical probability of raising wage levels: working full-time in the fall of 1985 (+$.75 per hour), male (+$1.57), training related placement (+$.63 for directly related placement), and graduating from a school in the metro-Boston economic region (+$.89). Although the results are not shown in the table, training in a "blue collar" occupation also is estimated to raise wages by $.70-$.80 over the baseline level.

As would be expected, later graduates (class of 1984) were estimated to receive wages $.45 lower than the baseline (class of 1983). A poor self-evaluation reduced wage levels, as did approval to send the supervisor a survey.

Since program and gender were so closely related, separate regressions were estimated for workers by sex and for particular occupations. While male graduates working full-time in 1985 received higher wages on the current job than other males, a similar result was not found for females.

Within occupational training categories, there was so little variation in wages that few coefficients were statistically significant. For example, neither job tenure nor training relatedness variables helped to explain the variation in wages for graduates schooled in the building trades. In fact, none of the programmatic or personal characteristic variables explained wage variables for this group.

SUMMARY

Regression analysis of wage variation confirmed earlier descriptive findings in Chapter 3. After controlling for other worker characteristics and labor market experience, males have much higher predicted earnings than females. Tenure on the current job, training related placement, and training in a "blue collar" occupation all had a positive influence on wages.

Within each occupational training category there was little evidence of wage variation. Interestingly, graduates' evaluations of vocational education academic and technical programs were not closely correlated with their eventual labor market outcomes. After controlling for other factors, dissatisfaction with vocational programs did not translate into lower wages on the current job.

APPENDIX II

SAMPLE SELECTION AND DATA COLLECTION METHODOLOGY

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SAMPLE SELECTION AND DATA COLLECTION METHODOLOGY

This Appendix discusses in detail our data collection methodology. As illustrated in the timetable below, several stages of activity took place over a period of months. These stages included obtaining student contact information from the schools, designing the survey instrument, conducting a pilot test, and finalizing the survey methodology and sampling plan.

June	- Schools contacted for information on graduates. - Advisory Panel convened.
July	- Survey instruments designed. - Small pilot test conducted. - Sampling plan draft proposed. - Ongoing follow-up with schools for contact information.
August	- Expanded pilot study recommended and begun.
September	- Expanded pilot study completed; results reviewed. - Survey methodology finalized. - Sampling plan finalized.
October	- Sample of 1,800 selected and prepared. - Follow-up with schools for telephone numbers.
November	- Interviewing.
December	- Interviewing completed - Surveys coded and keypunched. - Employer contact information processed. - Employer surveys mailed out.
January	- Reminder letter sent to employers - Employer surveys coded and keypunched.

OBTAINING STUDENT CONTACT INFORMATION

In mid-June, 56 schools whose names had been obtained through the Directory of Massachusetts Vocational Schools and Programs Offered were sent letters requesting their cooperation in the Department of Education's follow-up study of 1983 and 1984 Chapter 74 high school completers and leavers. Specifically, the letter explained the study and asked the Superintendent/ Director of each school to designate an individual to act as a contact person to compile and transmit the student record information needed to select the sample. In addition to an explanatory letter from the Commissioner, also enclosed was a list of eight items needed on each student, including address, sex, race, date of birth, occupation studied, date student left school, status (graduated/dropped out) and placement at departure.

Initial telephone contact with the schools revealed several problems. First, many of the items requested were unobtainable from school records. Most schools were unable to provide any information on race. This created a problem since it had been our intention to oversample by race in order to insure adequate representation of minorities in the sample. Additionally, the majority of schools contacted could provide no information at all on students who had not completed the program.

It became evident as well that the start-up timing of our effort was somewhat problematic. Schools had just ended classes and most administrators indicated that the summer staff was not at all equipped to handle such a request. Some schools were extremely cooperative however, and their record system enabled them to comply immediately; others, it seemed, would be unable to comply within the time frame we had established.

Based on these observations and the input of the Advisory Panel, it was decided to reduce the information requested to just contact information and trade studied and to eliminate 'leavers' from the study in the hopes of making the task more feasible for the schools' summer staff. The significance of this decision however was twofold. First, the study would only involve graduates and would not provide us with any final data on the progress of those who had left school before graduating. Second, the sampling plan would have to be revised since it would be impossible to oversample by race. Additional implications involved changes in the survey instrument to obtain such information as sex, race, date of birth, and trade studied.

Although these changes in the request greatly increased most schools' ability and willingness to cooperate, timing and staff constraints remained a problem in several cases. It was evident that it would be impossible for all the schools to supply the needed information by mid-July as requested. In the meantime, other pre-survey activities were begun, including processing the incoming contact information, designing the survey instrument, conducting a pilot test and finalizing the survey methodology and sampling plan.

DESIGNING THE INSTRUMENT

Development of a survey instrument was begun using as a model the instrument from a previous study of this type done for the Department of Education. Several minor changes were made to improve the appearance, structure, meaningfulness and overall appeal of the instrument. The main issue in designing the instrument was striking a balance between the informational needs of the Department of Education and the respondents' need for a brief, simple, comprehensible form. The first rough draft was reviewed at the June meeting of the Advisory Panel; additional changes were discussed and later incorporated.

PILOT TEST

A small pilot test was then designed to test out the content, wording and structure of the instrument with actual vocational graduates. The methodology used was the same as that proposed for the actual study: an initial mailing with telephone follow-up to nonrespondents. A list of 15 graduates was obtained from Pathfinder for this purpose. Surveys were mailed out on July 7, with only one completed and returned a week later. Telephone follow-up began on July 21, having allowed two weeks for mail returns, and resulted in a final overall response rate of 45 percent.

OBSERVATIONS FROM THE PILOT TEST

The pilot test raised several important issues. Of primary importance was the apparent need it revealed for changes in the survey instrument and cover letter. It seemed that graduates were not motivated by the survey to participate. Since the study itself offered no tangible reward to participants and respondents were not apparently motivated by any sense of social obligation (i.e. to help out their school, etc.), it was decided to revise the wording and format of the survey instrument (which, as mentioned earlier, was based largely on the last vocational education study's survey) and cover letter to increase the appeal, ease and meaningfulness to the respondents.

The cover letter was revised to be more appealing to the possible motives of the graduates. Each letter was personalized with the individual's name, address and the name of the vocational school attended. The revised letter attempted to emphasize the importance of the individual's unique views and his/her responsibility for helping out. Additionally, it was felt that the original letter's immediate mention of our desire to contact employers, as well as the lack of explanation of how these graduates were chosen for the study, may have discouraged some graduates from participating; this was corrected in the revised letter.

To increase the immediate appeal of the survey, it was necessary to rearrange the sequence of topics, so that the first few questions were easy, brief, relevant to all respondents and of general interest. Additionally, beginning the questionnaire with more general, education/perception-related questions would reassure the respondents of the study's purpose, rather than risk offending them with immediate requests for personal and wage information. Other changes in the instrument involved rewording and restructuring of several questions, which were too abstract or ambiguous to be meaningful to respondents.

Additional concerns raised by the pilot involved response rate and methodology. The telephone follow-up, which had become considerably more important due to the mailing's poor response rate, was significantly hindered by the pilot school's failure to provide us with phone numbers of graduates. The contact information from the sample schools varied greatly in the amount and form of information provided; however, between 10 and 20 percent of the schools had not supplied phone numbers by the end of July. Because this would undoubtedly lower the telephone response rate in the actual study, additional follow-up was undertaken to obtain phone numbers from all schools (only 2 or 3 schools ultimately were unable to send numbers). Another concern related to response rate was methodological. It was unclear from such a small test whether the mail/telephone follow-up was actually an efficient strategy for this particular population. Thus, to determine more specifically what combination of mail and telephone effort would balance the time and budget constraints with the necessary methodological rigor, it was decided to implement a larger, more representative pilot, using a randomly selected sample that we would later include in the actual study sample.

THE EXPANDED PILOT

A simple systematic random sample which was 10 percent of the sample size proposed was drawn from the lists of graduates supplied by the schools. A total of 188 graduates was selected from 53 schools. At the time this sample was drawn, several schools had not yet sent student information and could therefore not be included.

On August 21, the surveys and cover letters were sent out along with postage-paid envelopes. By the end of approximately one week, 20 of these had been returned as undeliverable and 7 came back with address correction labels. By the end of a two-week period, only 24 completed surveys had been returned to us. Since only 20 were undeliverable, we assumed the remaining 168 were received, at least by a family member if not by the graduates themselves.

For the purpose of testing out the most effective method of reaching these nonrespondents, the group was divided in half--one half to receive mail follow-up, the other half telephone follow-up. Twenty of the addresses determined from the first mailing to be no longer valid were included in the telephone group so that we would be able to more actively pursue leads and track down the respondents.

A reminder letter was sent out to 82 nonrespondents two weeks after the initial mailing. A response rate of 16 percent (13 completes) was obtained from this second mailing, including 3 respondents who did not have the time or inclination to do a written survey but actually called to complete it by phone.

Two weeks after the first mailing, telephone follow-up on the other half of the nonrespondents began. As mentioned before, this group included all the "bad addresses" from the first mailing (several of which were from schools that had not supplied any phone numbers). This particularly difficult group, as well as other phone number problems that arose, were rigorously tracked using regional phone books and directory assistance. Calling shifts ranged from 8:30 AM to 9:00 PM and included weekends as well.

At the end of a two-week calling period, 49 percent of the group (40 completes) had been successfully completed. In 75 percent of the phone cases, we were able to make contact with a family member, if not the respondent him or herself. This is significant in that it enabled us either to obtain new contact information for the respondent who had moved, or to pinpoint the best time to reach the respondent at that number. Thus over 80 percent of the completes were obtained with 5 or fewer phone attempts. The cases requiring more than five attempts were usually graduates working odd hours, or rarely home.

From our contact with parents, we were able to learn that three graduates were away in the armed services, one was in a mental institution, and two had moved out of state and could not be reached. A small group of respondents seemed to be actively avoiding us, with considerable help from their parents. After numerous attempts to reach the respondent and much runaround from the parents, a second survey was sent (since the addresses were known to be correct) in the hopes of reaching the respondents.

It should be noted that in spite of these difficulties, at least one-quarter of the telphone completes were respondents no longer living at their parents' addresses, some having moved as far away as New Hampshire, Rhode Island, and California. Additionally, persistent tracking by phone enabled us to finally complete 20 percent of the surveys that had originally been returned as undeliverable. Although that 20 percent represents a fairly small number of students, it is nonetheless significant as it adds to the results a certain segment of respondents (that is, frequent movers or difficult to locate) whose absence could have biased to a degree the findings of a mail survey.

OBSERVATIONS FROM THE EXPANDED PILOT TEST

Thus we found that telephone follow-up yielded a higher response rate and a more representative sample of graduates. Additionally since telephone interviewing enabled the interviewer to probe for clarity, respond to questions, and explain any points of confusion, it provided higher quality data and a much higher rate of permission to contact employers. Approximately twice as many students interviewed by telephone consented to have their employer interviewed. Slightly more than 80 percent of telephone respndents currently working gave their permission as compared with just under 50 percent of mail respondents.

In view of the clear advantages provided by a telephone effort and the extremely low mail response rate, it was collectively decided to proceed with the interviewing entirely by telephone. The time and expense of even one round of mailing could not be justified by the response rate, which at very best would reach only 20 percent. Since the instrument seemed to work well in the subsample test and required no further revisions, it was decided to start the phone effort immediately. With final methodology for student survey established, the next task was to select a sample of students for attempted contact.

ESTABLISHING A SAMPLING PLAN

Our sampling plan thus was designed to balance budgeting concerns with our concern for methodological rigor. Our intention was to interview approximately 1,200 graduates, which is the size of most national opinion polls. Additionally, we wanted to achieve a 60-70 percent response rate to maximize the representativeness of the respondents and minimize bias. To achieve this, a starting sample size of 2,000 graduates from both years was needed. This represented an 8 percent sample from the total population of approximately 22,000 1982-83 and 1983-84 graduates. The self-weighting approach that we implemented (described below) simplified both the logistics of drawing the sample and the analysis of survey responses.

In addition, the high anticipated response rate and the large final sample (1,200 respondents) would provide a representative and precise set of findings about how vocational education graduates rate the training they received. For example, under very conservative assumptions, we would be able to provide estimates of the percentage of graduates who rate their vocational education training favorably to within plus or minus 3 percentage points with 95 percent confidence. For example, if 60 percent of the sample rated their vocational education training favorably, then we could be 95 percent confident that between 57 and 63 percent of all 22,000 1982-83 and 1983-84 graduates do so.

As we agreed upon, we sampled graduates from all 43 selective schools, all 16 comprehensive schools with at least 5 vocational education programs and a sample of the 45 schools with 1-4 vocational education programs. The 59 schools in the first two categories are hereafter referred to as "certainty" schools and the 45 schools in the third group are referred to as "noncertainty" schools.

Exhibit 1 summarizes the total number of 1982-83 and 1983-84 vocational education graduates from each group of schools and Exhibit 2 summarizes corresponding sample sizes for an 8 percent sample. Note than an 8 percent sample from each group produces a proportionally stratified sample.[1]

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[1] This stratification serves two purposes: (1) it increases the statistical precision of survey findings and (2) it ensures the same relative representation for each group of schools.

Exhibit 1

Population Size by Year and Type of School

Type of School	Number of Schools	1982-83 Graduates	1983-84 Graduates	Total Graduates
"CERTAINTY" SCHOOLS				
Selective	43	8,041	7,811	15,852
Comprehensive	16	1,612	1,537	3,149
"SAMPLED" SCHOOL	45	1,657	1,282	2,939
TOTAL	104	11,310	10,630	21,940

NOTE: Based on data provided by the Massachusetts Department of Education.

These figures were later revised based on data collected directly from the sampled schools.

Exhibit 2

Sample Size by Year and Type of School

Type of School	Number of Schools	1982-83 Graduates	1983-84 Graduates	Total Graduates
"CERTAINTY" SCHOOLS				
Selective	43	643	624	1,268
Comprehensive	16	129	123	252
"NON-CERTAINTY" SCHOOL	9	133	103	235
TOTAL	68	905	850	1,755

NOTE: Sample sizes represent 8 percent of the population in all cases.

Sample sizes were revised slightly based on data collected directly from the schools. See Chapter 2 for data on final sample sizes and response rates.

The major sampling question was how many "non-certainty" schools to include in order to produce a sample of the desired size for this group (133 1982-83 graduates and 103 1983-84 graduates). Because of the small sample and the high "fixed costs" per school of sampling graduates from this last group, it was not feasible to include all schools.

"Fixed costs" would include the time and effort involved in gaining the cooperation of each school and obtaining lists of vocational education participants from which to sample. To accomplish this task for the 59 "certainty" schools would have required a major commitment of resources. Substantially more resources per school would have been required for the sampled "non-certainty" group to overcome their prior lack of involvement with the vocational education community.

An appropriate criterion for choosing the number of "non-certainty" schools sampled was to equalize their average cost per graduate sampled with that for "certainty" schools. If "fixed costs" were the same for "certainty" and "non-certainty" schools, this would imply equalizing average sample size per school for the two groups. The average sample per "certainty" school is 26 graduates. Given the need for 235 "non-certainty" school sample members, this implied a sample of 235/26, or 9 "non-certainty" schools.

We drew this sample of 9 schools with probability proportional to size with a constant size sample of 26 graduates from each school. This procedure had two primary benefits: (1) it produced a self-weighting sample; and (2) it helped to ensure that larger vocational education programs would be included in the sample.

Thus by combining our sampling procedures for the 59 "certainty" schools with the procedures for the 9 "non-certainty" schools, we were able to provide a fully self-weighting sample of vocational education programs in the state, stratified by type of program (selective schools, comprehensive schools with five or more vocational programs and comprehensive schools with 1-4 vocational education programs).

INTERVIEWING

Once the sample was chosen and student contact information set up on a LOTUS 1-2-3 tracking system, interviewing began. On November 5th, the interviewing team participated in an intensive training session which not only familiarized them with the study and results from the pilot tests, but also emphasized effective approaches for obtaining permission to contact employers and extracting detailed comments and opinions. Practice interviews enacted by pairs of interviewers were observed and critiqued individually.

Full-scale phoning efforts continued until Thanksgiving weekend, with interviewers calling from 9 AM to 9:30 PM seven days a week. After that time, a handful of the most experienced interviewers were retained for an additional week to work on the most promising cases remaining as well as on refusal conversion. Throughout the survey, on-going tracking procedures which included both directory assistance and regional phone books yielded a small number of successful leads and eventual completes. Interviewing ended the first week of December with a total of 1,210 completes (including 90 from the pilot sub-sample). The final response rate was 61 percent.

Several problems, many of which had been anticipated prior to beginning the survey, prevented us from reaching respondents. One of our concerns in attempting a telephone survey was the mobility of this particular population. Although a surprising number of graduates could still be reached at their parents' number, about 15 percent of the sample called were households that had no knowledge of the respondent, and no further information could be obtained through directory assistance. Approximately 6 percent of the numbers were in fact correct; however, the parents were either unable or unwilling to give us the graduates' new number or address. In 8 percent of the cases, we were simply not able to make contact with the respondent, although the number was correct. Additionally, a very small percentage of the sample could not be interviewed because the respondents had died, were seriously ill, in jail or institutions, or claimed to have never taken any vocational education courses. A more complete breakdown of the major difficulties encountered follows.

Reason Respondent Not Contacted	Approximate % of Sample
Away in military	4%
Parent unable or unwilling to give new number	6%
Multiple attempts but never reached respondent directly	8%
Wrong number--no knowledge of respondent. No listing in directory assistance	15%
Number disconnected or changed to unpublished	4%

THE EMPLOYER SURVEY

As we had anticipated, a telephone approach was extremely successful in enabling us to obtain the respondent's permission to contact their employers. Approximately 70 percent of the 1,210 gave us this permission. Although many students were willing to give us permission, a surprising number did not know the street address or phone number of their employer; in a few cases, they were unsure who their immediate supervisor was. While we made every reasonable attempt to verify the street or supervisor's name, in approximately 10 percent of the cases, employer surveys mailed out were returned as undeliverable.

Surveys were mailed out to employers in weekly batches while the telephone interviewing was still continuing. By early January, approximately 30 percent had been returned completed. A reminder letter sent out in mid-January urging employers to call and complete the survey by phone produced a significant response. Many employers had either lost or simply disregarded the survey, or else did not have the time or inclination to complete the written survey, although it was less than two pages long. By the end of January, additional mail and telephone completes totaled 439 or 64 percent.

Both graduate and employer surveys were edited for completeness; telephone retrieval of missing information was employed whenever feasible. Questionnaires were then coded and keypunched with 100 percent verification on standard 80-column cards. Information from the employer records were then merged on a case by case basis with the corresponding student data record for the purpose of correlating responses.

APPENDIX III

GRADUATE SURVEY INSTRUMENT

RESPONDENT ID# ______________ 1-6/

Hello. I'd like to speak to (RESPONDENT NAME) .

INTRODUCTION:

Hello. This is __________________, calling from Abt Associates in Cambridge. We're helping the Massachusetts Department of Education evaluate high school vocational programs in the state.

Our records show that you graduated from (SCHOOL NAME) . I'd like to ask you a few questions about your vocational education and your work experience since graduating. Your answers will help the Department of Education decide what improvements need to be made in vocational high schools.

Your participation in this study is, of course, voluntary. All of your answers and comments will be kept strictly confidential.

* * * * * * * * * * * * * * * * * * * *

TIME STARTED:_________

SECTION I

First, I'd like to ask you a few questions about your experience at (SCHOOL NAME) .

1. In general, how well do you feel your high school vocational program prepares students for work? Would you say very well, adequately, or not at all?

VERY WELL..................1		
ADEQUATELY.................2		
NOT AT ALL.................3		7/

2. What trade did you study in your high school?

____ 8-9/

3. I'd like you to think back to your high school days in shop. Please answer the following questions with definitely, somewhat, or not at all.

Did your shop instructors (READ ITEM):

	DEFINITELY	SOMEWHAT	NOT AT ALL	
-have up-to-date technical knowledge needed in the trade today?..............	1	2	3	10/
-teach you the skills you'd need to get a job in your field?.........................	1	2	3	11/
-care about the quality of your work?......................	1	2	3	12/
-teach you social skills (like how to get along with others, resolve conflicts, etc.)?.........................	1	2	3	13/
-teach you good work habits?......	1	2	3	14/
-teach you problem-solving skills?..........................	1	2	3	15/
4. Were the teachers and staff at your high school helpful to you in getting a job?..........	1	2	3	16/

5a. Which of the following would have been the most helpful thing the shop instructors and staff could have done when you were a senior to help you get a job? (READ LIST. CIRCLE ONE.)

Make contact with employers..........................	1	17/
Arrange interviews..................................	2	
Teach you interviewing and job application skills....	3	
Have a bulletin board listing job openings...........	4	
Provide employment counseling........................	5	

b. What else could they have done to help you? (PROBE.)

____ 18-19/

____

6. Overall, would you say the technical training you received in your high school vocational program was excellent, good, fair, or poor?

EXCELLENT	1	20/
GOOD	2	
FAIR	3	
POOR	4	

7. How would you rate the education you received in your high school in the following academic areas? (READ ITEM). Would you say excellent, good, fair, or poor?

	EXCELLENT	GOOD	FAIR	POOR	
Reading	1	2	3	4	21/
Writing	1	2	3	4	22/
Math	1	2	3	4	23/
Science	1	2	3	4	24/
Verbal skills, that is the ability to express yourself well verbally	1	2	3	4	25/

8a. Are you currently enrolled in school or training? (PROBE: Full-time? part-time?)

YES, FULL-TIME	1	26/
YES, PART-TIME	2	
NO, NOT ENROLLED (SKIP TO Q.9)	3	

b. (IF YES): What type of program is it? Is it a:

Two-year program	1	27/
Four-year program, or	2	
Something else? (PROBE FOR SPECIFICS)	3	

________________________________ 28-29/

c. (IF YES): What are you studying? (PROBE: What field/major?)

____ 30-31/

Now we would like to ask you a few questions about your employment since graduating from your high school vocational program.

9a. Were you working at this time last year?

YES....................1 34/
NO (SKIP TO Q.9d)......2

b. (**IF YES**, READ LIST. CIRCLE ONE.) Was that:

Full-time..............1
Part-time..............2
Self-employed or.......3
In the military?.......4

c. How much were you making per hour? 35-36/

$___ ___.___ ___ PER HOUR 37-38/
(SKIP TO Q.10)

d. (**IF NO**): Were you in school full-time?

YES....................5
NO.....................6

NOTE: IF RESPONDENT STATES THAT HE/SHE HAS NEVER WORKED, SKIP TO 10d.

10a. Are you currently working?

YES....................1 39/
NO (SKIP TO 10d).......2

b. (**IF YES**, READ LIST. CIRCLE ONE.) Is that:

Full-time,.............1
Part-time,.............2
Self-employed, or......3
In the military?.......4

c. How much are you making per hour? 40-41/

$___ ___.___ ___ PER HOUR 42-43/
(SKIP TO Q.11)

(**IF NO**):

10d. How long since you last worked for pay? ________ MONTHS/YEARS

LESS THAN 6 MONTHS.....1 44/
6-12 MONTHS............2
MORE THAN ONE YEAR.....3

10e. Are you currently looking for work?

YES....................1 45/
NO.....................2

11. How many full-time jobs have you had since graduating, including your current job, if you're working now?

ONE..............................1 46/
TWO..............................2
THREE............................3
FOUR OR MORE.....................4
NO FULL-TIME JOB SINCE
GRADUATING.......................5
HAVE NEVER WORKED SINCE
GRADUATING (SKIP TO SECTION
II, PAGE 7)......................6

12. Thinking about your (current/most recent) job, please answer the following questions with definitely, somewhat, or not at all.

	DEFINITELY	SOMEWHAT	NOT AT ALL	
-Do you have the technical skills to do the job?.............	1	2	3	47/
-Is your boss generally satisfied with the quality of your work?....	1	2	3	48/
-Do you enjoy working?.............	1	2	3	49/
-Do you get along with your coworkers?........................	1	2	3	50/
-Do you feel you have good work habits?...........................	1	2	3	51/

INTERVIEWER: IF Q.10a IS "YES" (RESPONDENT IS CURRENTLY WORKING), CONTINUE WITH Q.13.

IF Q.10a IS "NO" (NOT CURRENTLY WORKING), SKIP TO Q.19, PAGE 7.

Now, I have a few more questions about your current job.

13a. Would you say your job is directly, somewhat, or not at all related to your high school vocational training?

DIRECTLY RELATED (SKIP TO Q.14)..1 52/
SOMEWHAT RELATED (SKIP TO Q.14)..2
NOT RELATED......................3

b. IF NOT RELATED:

What was the main reason you took a job not related to your training? (CIRCLE ONE RESPONSE.)

I PREFERRED JOB IN ANOTHER FIELD....................1 53/
I WAS NOT PREPARED WELL ENOUGH TO WORK IN MY FIELD...2
I COULD NOT FIND A JOB IN MY FIELD..................3
I FOUND A BETTER PAYING JOB IN ANOTHER FIELD.........4
THIS JOB IS TEMPORARY WHILE I CONTINUE MY EDUCATION..5
OTHER (PROBE FOR EXPLANATION:).......................6

____

____

14. How would you rate your ability to do the job compared with coworkers who did not attend a vocational high school? Are you better able to do the job, are they better able, or are you about equal?

I'M BETTER ABLE........1 54/
THEY'RE BETTER ABLE....2
WE'RE ABOUT EQUAL......3
I CAN'T COMPARE........4

15. How long have you had this job? ____________ MONTHS/YEARS

LESS THAN 6 MONTHS.....1 55/
6-12 MONTHS............2
MORE THAN ONE YEAR.....3

16. What is the name of the company you work for?

____
NAME OF COMPANY

And their address?

____
STREET

____
CITY/STATE/ZIP CODE

And their phone number?

(___)____________________
AREA CODE NUMBER

Because our study is concerned with how effective vocational schools are, we'd like your permission to send your boss a survey like this about how well vocational education prepared you for your job. It is designed to evaluate the overall effects of your high school vocational education, and is not intended to rate you as an individual.

17. Would it be okay for us to send your boss a survey like this?

YES....................1	56/
NO.....................2	

18. What's your boss' name?

____

SECTION II

Now I have some background questions to ask you.

19. INTERVIEWER: RECORD SEX. DO NOT ASK.

MALE...................1	57/
FEMALE.................2	

20. Do you consider yourself to be White, Black, Hispanic, American Indian, Asian/Pacific Islander or something else?

WHITE..................1	58/
BLACK..................2	
HISPANIC...............3	
AMERICAN INDIAN........4	
ASIAN/PACIFIC ISLANDER.............5	
OTHER (SPECIFY):.......6	

____

21. In what year were you born? 19___ ___ 59-60/B 61-62/B 63-64/

22. Have you moved more than 50 miles from where you lived when you graduated to take a job?

YES....................1	65/
NO.....................2	

23. Those are all the questions I have for you. We'd really like to hear any comments or thoughts you have on your high school vocational program. What would you like to tell us?

____ 66-78/B

____

____

____

____

____

____ 79-80/

TIME ENDED: ____________

INTERVIEWER'S NAME: ________________

APPENDIX IV

EMPLOYER SURVEY INSTRUMENT

Abt Associates Inc.
55 Wheeler Street
Cambridge, MA 02138

ID#: ____________ 1-7/

Employee: ____

Supervisor: ____

Your name and position, if different than above:

____

NAME POSITION

INSTRUCTIONS: Please answer all questions and return the completed form to us in the postage-paid envelope provided.

Your answers will be kept strictly confidential. Your name and your company's name will not be used in the final report or released to anyone.

1. How frequently do you observe this individual on the job?

1 - OFTEN 2 - ONCE IN A WHILE 3 - SELDOM/NEVER 8/

2. Are you aware of this individual's vocational high school education?

1 -YES 2 - NO 9/

3. Please answer the following questions by circling DEFINITELY, SOMEWHAT, or NOT AT ALL.

Does this employee have the technical skills needed to do the job?	DEFINITELY	SOMEWHAT	NOT AT ALL	10/
Are you satisfied with the quality of his/her work?	DEFINITELY	SOMEWHAT	NOT AT ALL	11/
Does he/she have a positive attitude towards the job?	DEFINITELY	SOMEWHAT	NOT AT ALL	12/
Does he/she get along with coworkers?	DEFINITELY	SOMEWHAT	NOT AT ALL	13/
Can he/she express him/herself well verbally?	DEFINITELY	SOMEWHAT	NOT AT ALL	14/
Does he/she have good work habits?	DEFINITELY	SOMEWHAT	NOT AT ALL	15/
Does he/she have good problem-solving skills?	DEFINITELY	SOMEWHAT	NOT AT ALL	16/

4. How would you rate the education this employee received in the following academic areas?

Reading....................	EXCELLENT	GOOD	FAIR	POOR	17/
Writing....................	EXCELLENT	GOOD	FAIR	POOR	18/
Math.......................	EXCELLENT	GOOD	FAIR	POOR	19/
Verbal Skills..............	EXCELLENT	GOOD	FAIR	POOR	20/

5. Would you say this individual's job is related to his/her high school vocational field?

1 - YES, DIRECTLY RELATED	2 - YES, SOMEWHAT RELATED	3 - NO, NOT AT ALL RELATED	21/

6. How would you rate this employee's ability to do the job compared to coworkers who have not had vocational high school training?

1 - THIS EMPLOYEE IS BETTER PREPARED	2 - COWORKERS ARE BETTER PREPARED	3 - THEY ARE ABOUT EQUAL	4 - I CAN'T COMPARE	22/

7. Do you feel vocational high school has prepared this individual to earn a living in his/her trade?

1 - DEFINITELY	2 - SOMEWHAT	3 - NOT REALLY	23/

8. Please use the space below to write your thoughts on how well vocational high school prepared this individual for employment.

24-60/B